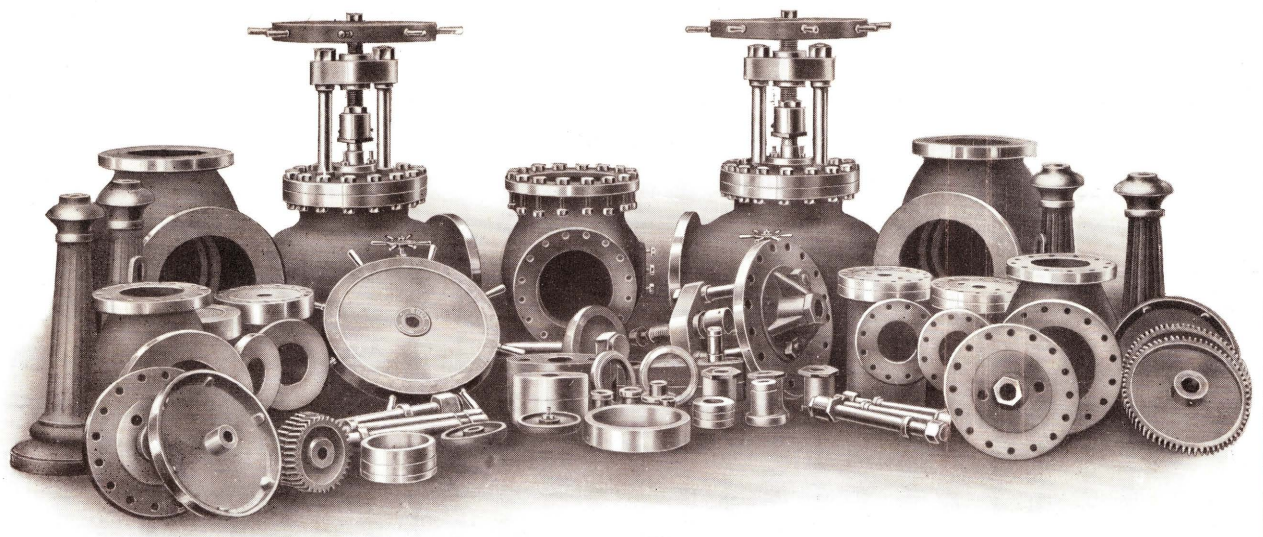
Steam Valves & Boiler Fittings

GALLOWAYS

LIMITED

Steam Valves and Boiler Fittings



GALLOWAYS
LIMITED

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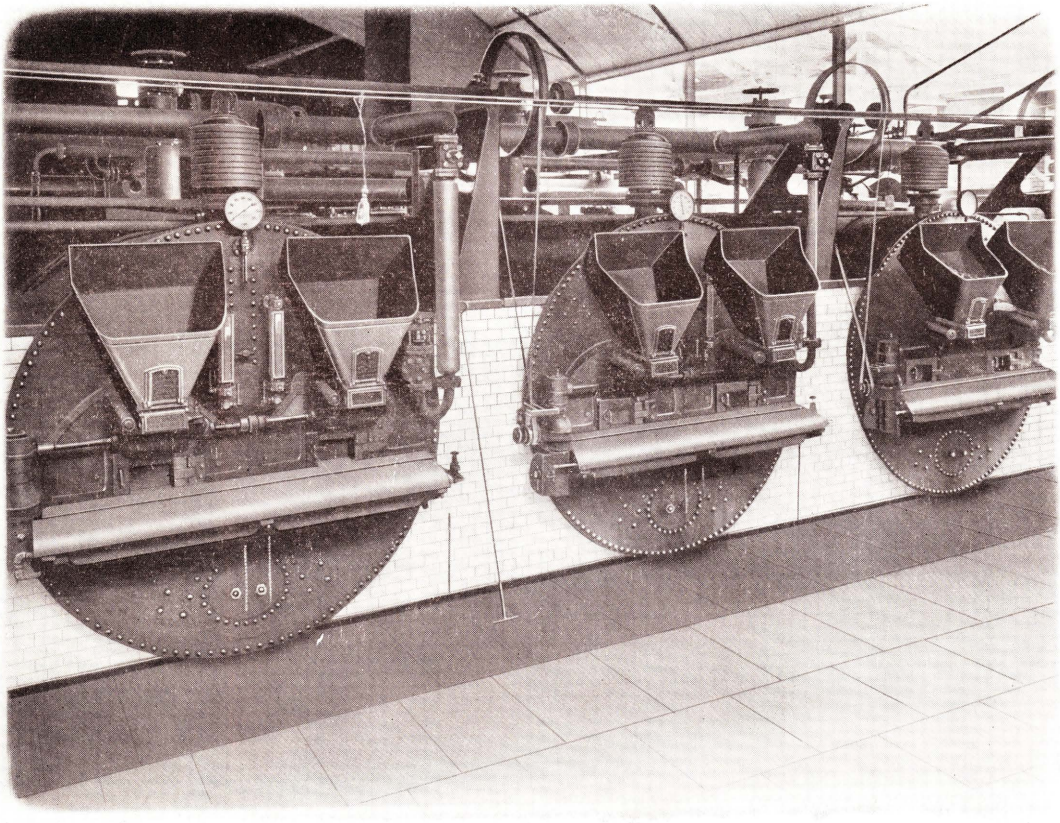
Old Court House Corner, CALCUTTA.

Engines and Boilers for Collieries, Steel Works, Factories, Pumping, etc.



Installation of Three Lancashire Boilers, 160-lbs. Working Pressure.

Oil Storage Tanks, Kilns, Kiers and Plate Work of all descriptions.

See separate pamphlets.

The Galloway Steam Valves and Boiler Fittings

GALLOWAYS Ltd., produce Steam Valves and Boiler Fittings of the very highest quality, workmanship and material, suitable for withstanding the high boiler pressures and the high temperatures of modern practice.

In the Metallurgical Department, at their Knott Mill Works, much research work has been carried out in investigating the behaviour of alloys of various compositions under high temperatures, with the result that an alloy having extremely valuable qualities has been perfected. This metal, **" Magnam "** by name, when subjected to high temperatures, retains its elasticity, and does not become brittle. It also possesses the qualities of extreme hardness and strength at all temperatures, and does not corrode under the most severe working conditions.

All the valves and seats of Galloway Steam Valves and Boiler Fittings are now made of **" Magnam " Metal,** which, being harder than such parts made in bronze, have consequently a much longer life. The seats of Galloway Valves are firmly secured and therefore cannot work loose.

The other materials used in their construction are all carefully selected, and are subjected to physical and chemical tests and micrographical examination, so that only the very best qualities of such materials are used in the manufacture of these high-grade fittings.

Special attention is paid to the workmanship and machine work, and the finish is of the highest class, similar to that found in all other Galloway productions.

Each complete valve is **thoroughly tested under steam,** and its suitability for use definitely proved before despatch.

When ordering valves or fittings kindly state size and figure number required, also working pressure of boiler ; Code Words are given on page 39.

The fittings are supplied with flanges drilled to British Standard Table II., see page 38 of this catalogue, unless special drilling instructions are given.

A number of valves with flanges not drilled are kept in stock for the convenience of clients.

The sectional line drawing of a Lancashire Boiler, Fig. 7, on page 9, shows the Boiler Fittings usually supplied, also their relative positions on the Boiler.

Steam Valves

ALL VALVES
and SEATS
of
" MAGNAM "
METAL.

ALL VALVES
are
TESTED
UNDER
STEAM.

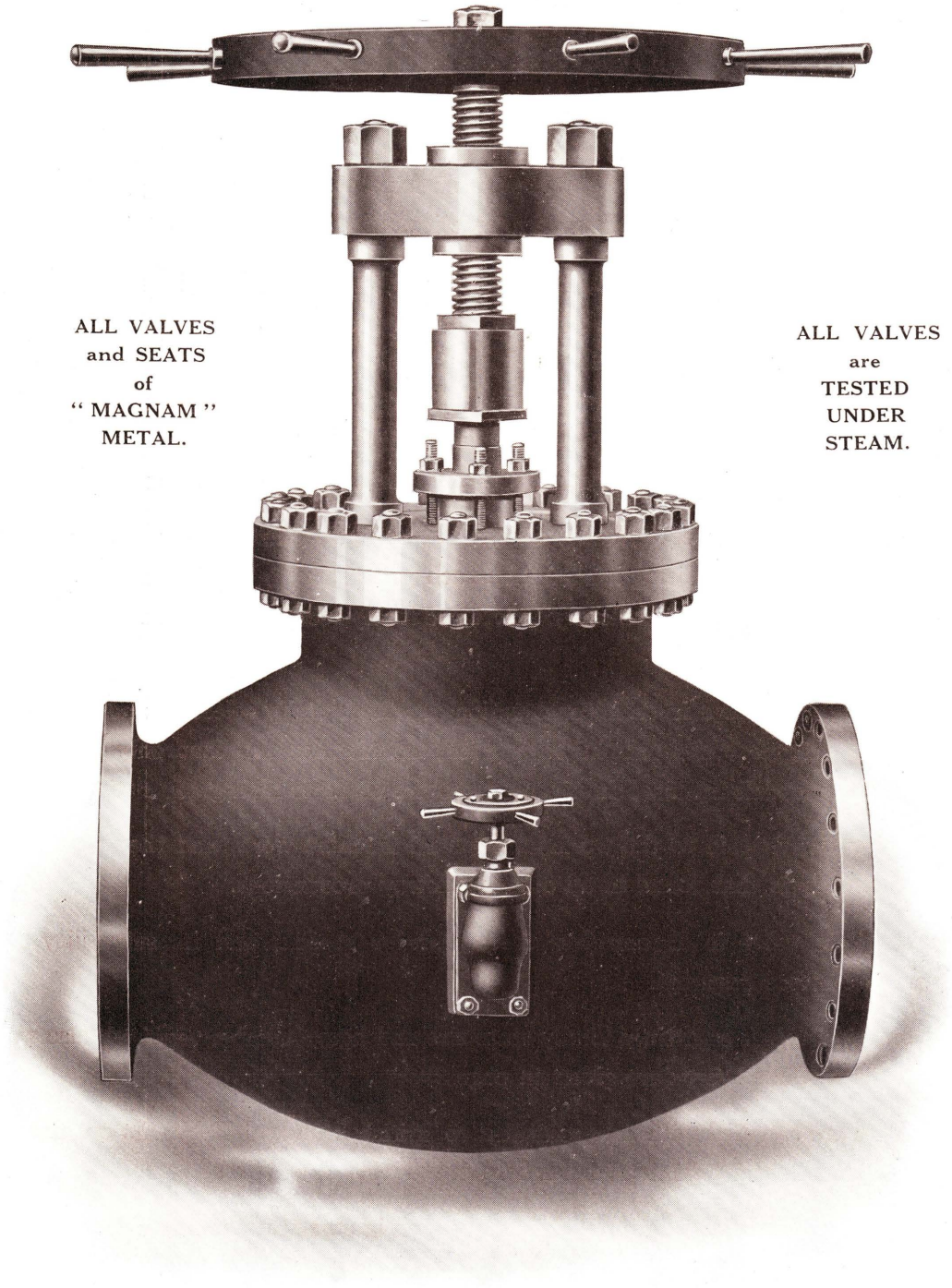


Fig. 1. Ref. B 36·1
15-in. Stop Valve, with Cast-steel Body. Working Pressure, 225-lbs. per square inch.

Galloway's Non-corrosive "Magnam" Alloy

for High Pressures and Highest Superheat

" Magnam " Metal possesses the qualities of extreme hardness and strength at all temperatures. It also retains its elasticity and does not become brittle.

Below is given a comparison of representative Brinell Hardness Numbers of various metals, obtained at normal temperature.

" MAGNAM "..220 ; Cast Iron..160 ; Wrought Steel..125 ; Gun-metal..70.

The following figures are results of recent tests of **" Magnam " Metal** when subjected to temperature :—

Brinell Hardness. Number.	Temperature. ° Fah.
223	60
217	482
197	662

After the metal had cooled it was found that the original degree of hardness had been regained.

No alterations in the properties of **" Magnam " Metal** take place after lengthy periods of service at the temperature of superheated steam.

The tensile strength is considerably higher than the best gun-metal, and the low ductility shows that the metal is resistant to deformation.

Steam Valves

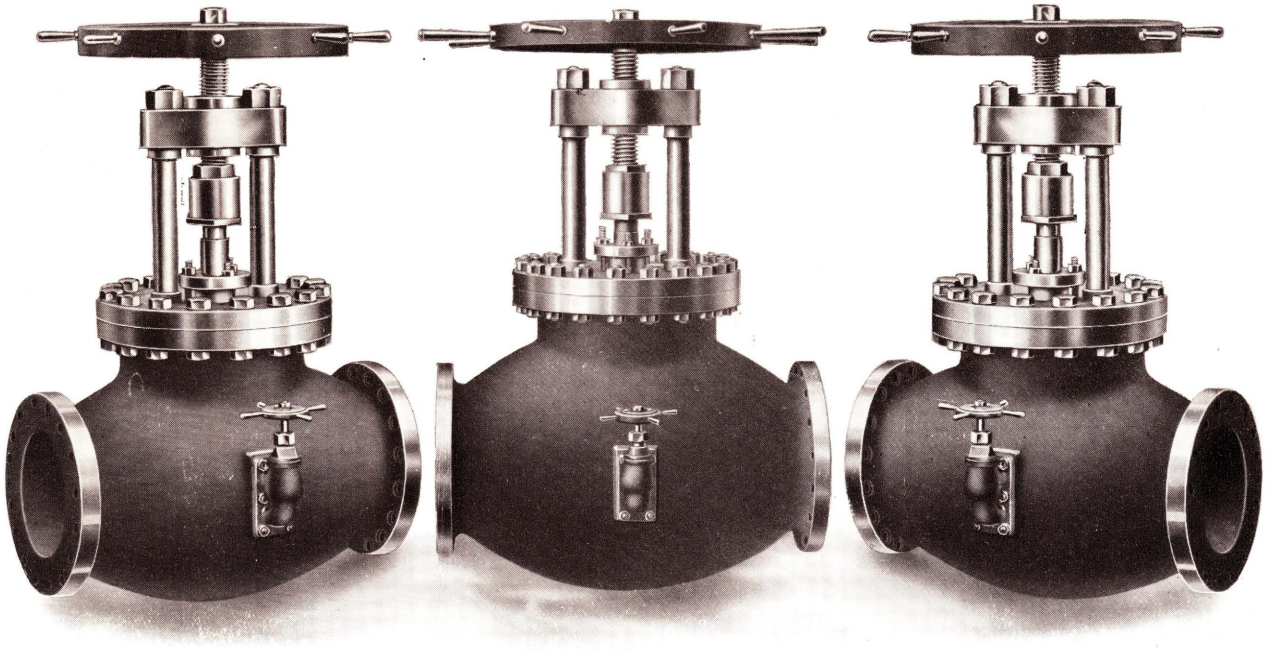


Fig. 2. Ref. B 36·1
12-in. Stop Valves. Cast-steel Bodies. 225-lbs. per square inch Working Pressure.

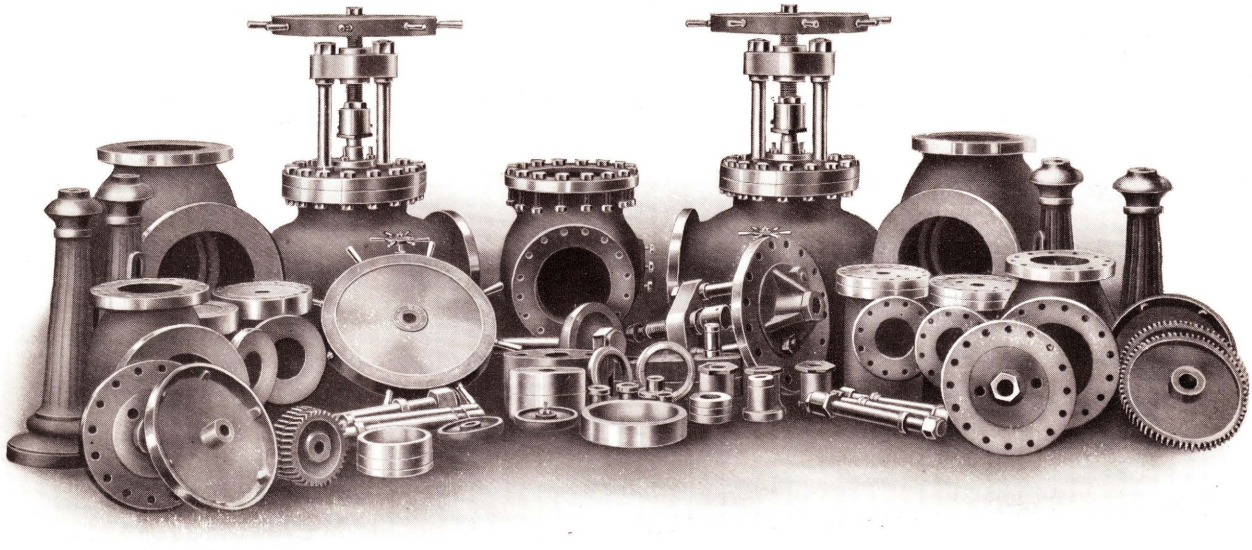
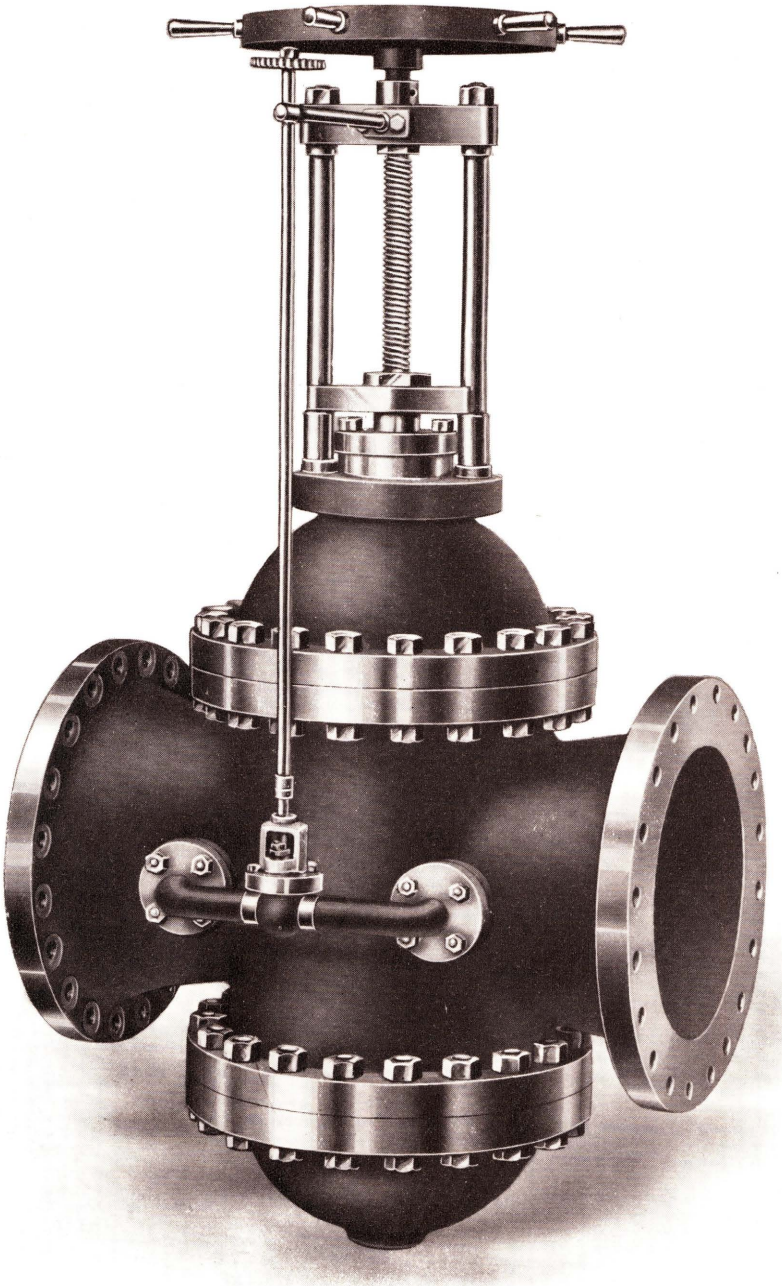


Fig. 3. Ref. B 36·1
Group of 8-in., 12-in., and 15-in. Stop Valves. 225-lbs. per square inch Working Pressure.

Steam Valves

"MAGNAM"
METAL
FACED.



TESTED
UNDER
STEAM.

Fig. 4. Ref. B 36·1
16-in. Main Engine Stop Valve. Cast-steel Body. Working Pressure, 225-lbs. per square inch.

Columns and Geared Extension Spindles

to suit requirements.

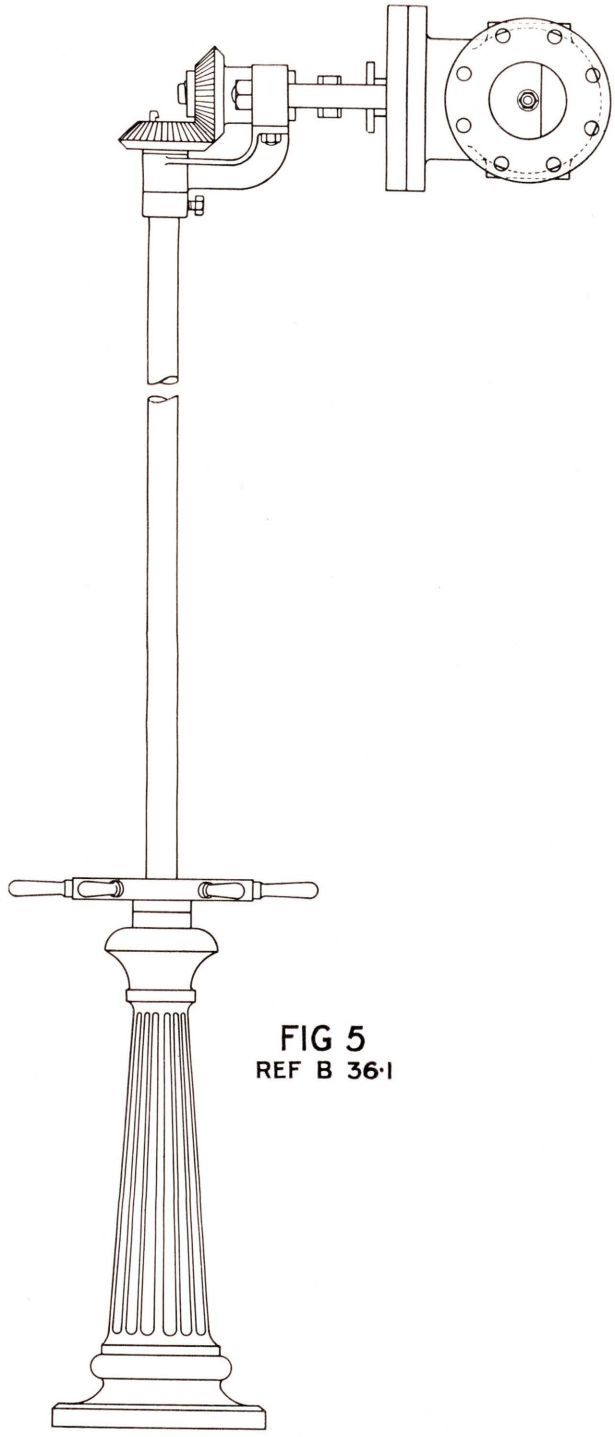


FIG 5
REF B 36·1

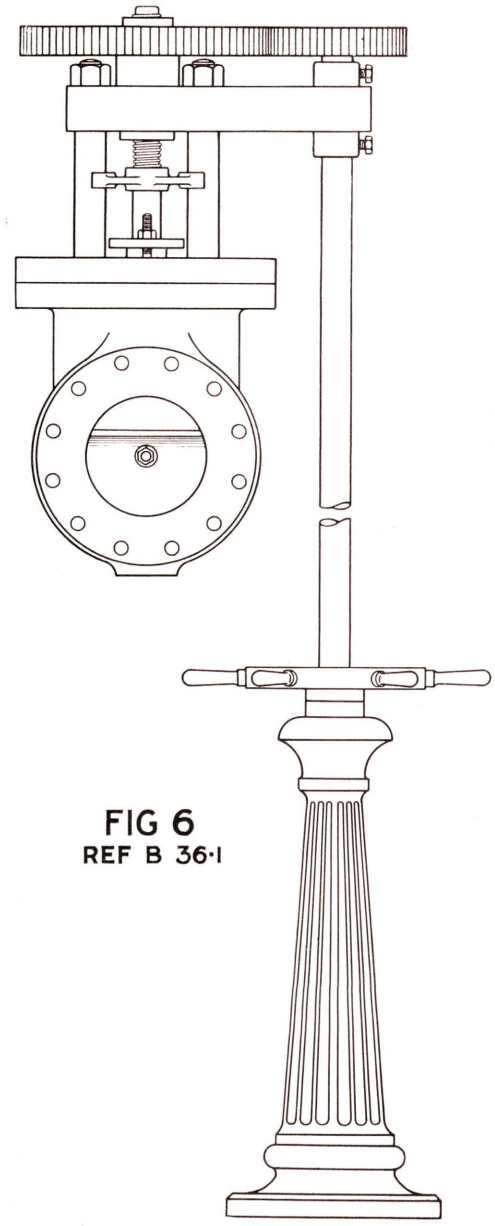


FIG 6
REF B 36·1

Boiler Fittings of the Highest Class

All Valves and Seats of special "MAGNAM" Alloy

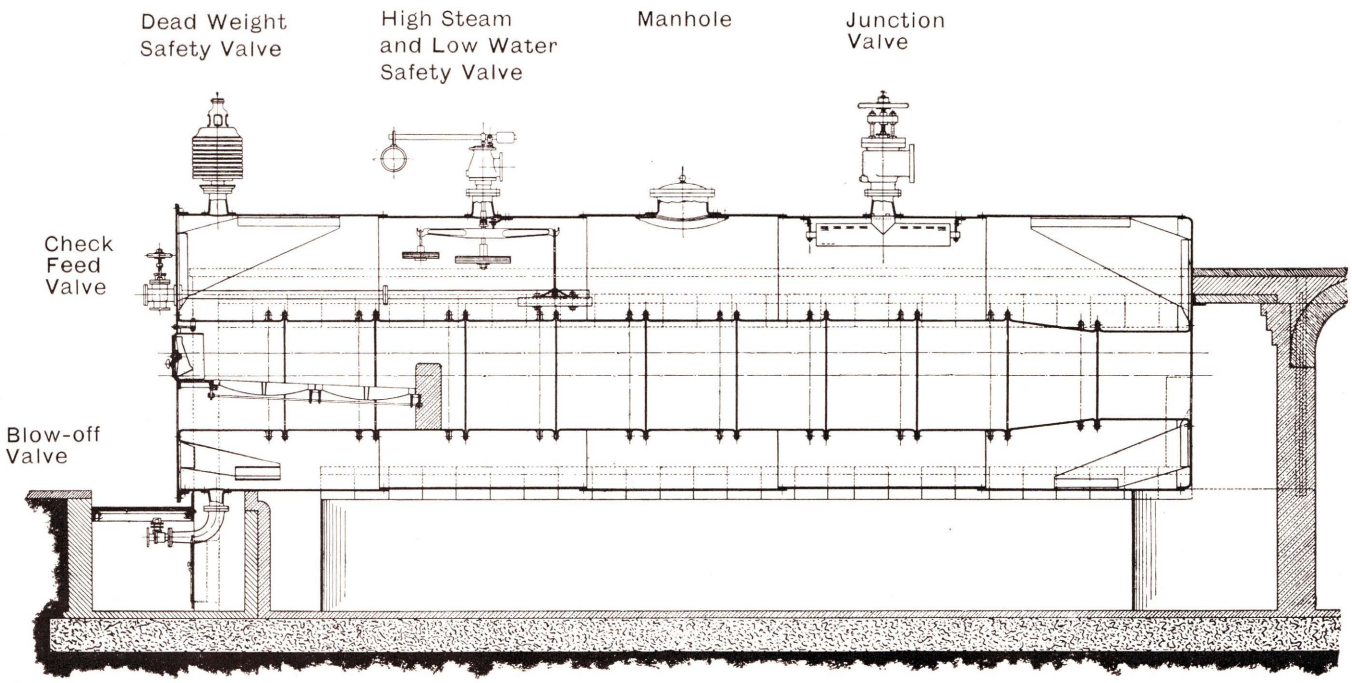


Fig. 7. Ref. B 36·1

Longitudinal Section of Standard Lancashire Boiler, showing relative position of Fittings.

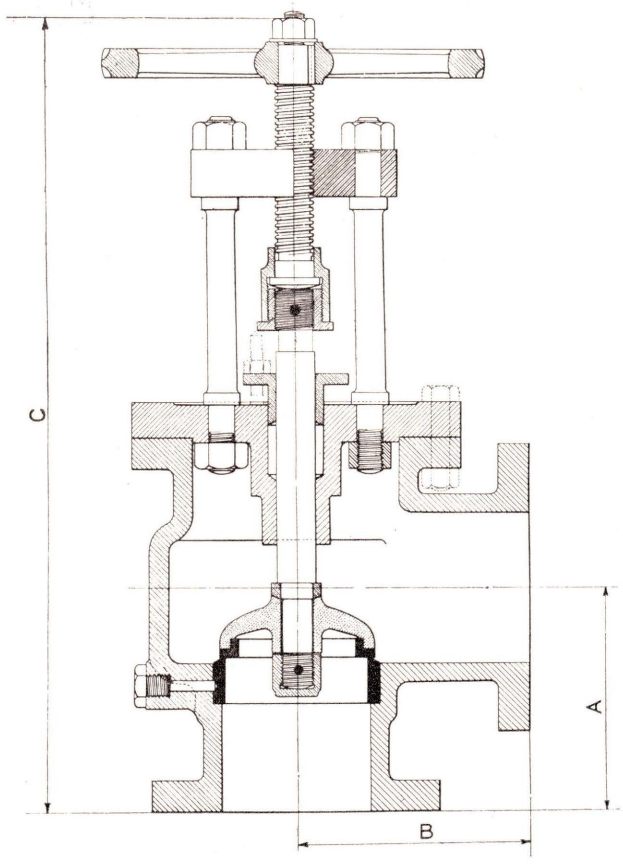
The Galloway Junction Valve

"Magnam" Metal Valve Face and Seat

Special Features

Divided Spindle.

No rotation of spindle in stuffing box.



Special Features

Easy to open and easy to close by hand wheel only.

No need for levers or crowbars.

Fig. 8. Ref. B 36·1

Dimensions of the Galloway Junction Valves

Size of Valve .. .. inches	3	4	5	6	7	8
Diameter of Inlet and Outlet Flanges .. .. inches	8	9	11	12	$13\frac{1}{4}$	$14\frac{1}{2}$
Thickness of Flanges { Cast Iron .. .. .. ,,	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$
Thickness of Flanges { Cast Steel .. .. .. ,,	1	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Number and Size of Bolts .. .. ,,	$8—\frac{5}{8}$	$8—\frac{5}{8}$	$8—\frac{3}{4}$	$12—\frac{3}{4}$	$12—\frac{3}{4}$	$12—\frac{3}{4}$
Diameter of Pitch Circle .. .. ,,	$6\frac{1}{2}$	$7\frac{1}{2}$	$9\frac{1}{4}$	$10\frac{1}{4}$	$11\frac{1}{2}$	$12\frac{3}{4}$
Dimension A .. .. ,,	6	$7\frac{3}{4}$	$8\frac{3}{4}$	$9\frac{1}{2}$	$10\frac{1}{2}$	$11\frac{1}{2}$
Dimension B .. .. ,,	7	8	$9\frac{1}{4}$	10	11	12
Dimension C, valve closed .. .. ,,	28	$29\frac{1}{8}$	$31\frac{1}{2}$	$33\frac{3}{8}$	$36\frac{1}{2}$	$39\frac{7}{8}$

Dimensions of Larger Sizes on application.

The Galloway Patent Angle Pattern Stop Valve

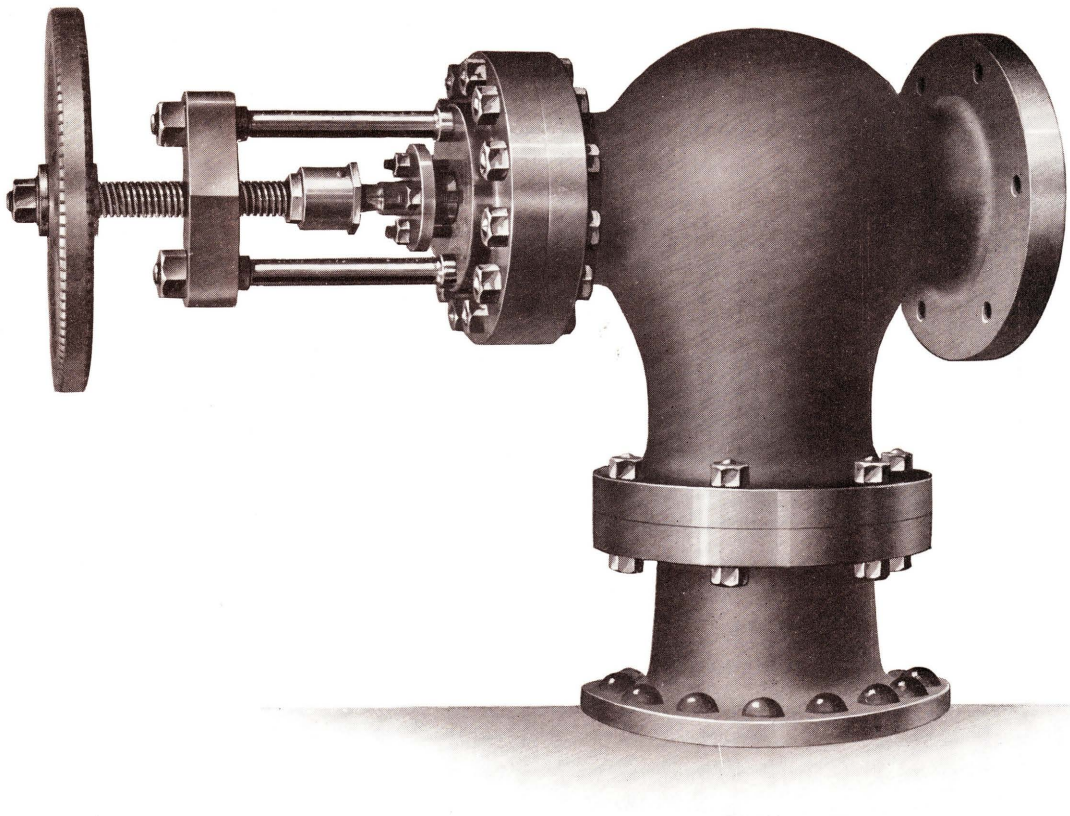


Fig. 10. Ref. B 36·1

ADVANTAGES :—

Steam tightness, owing to absence of distortion.

Low cost of spare parts.

Owing to the valve and seat always being surrounded by boiler steam, these parts are relieved from strain when standing with the valve shut.

Ease of renewal or regrinding of valve and seat owing to their small size.

The seat and the valve are protected.

Ease of handling.

Spindle can be repacked under pressure.

The design is such as to permit of the use of the small valve seat without loss of pressure.

The Galloway Patent Angle Pattern Stop Valve

Valve and Seat of "MAGNAM" alloy

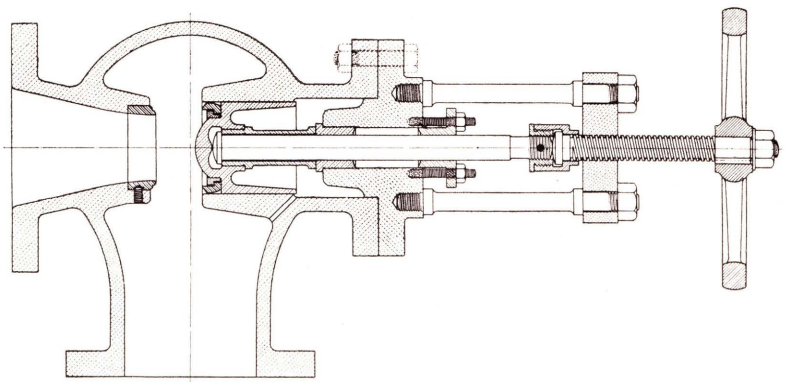


Fig. 11. Ref. B 36·1

For Dimensions of Flanges, see page 10.

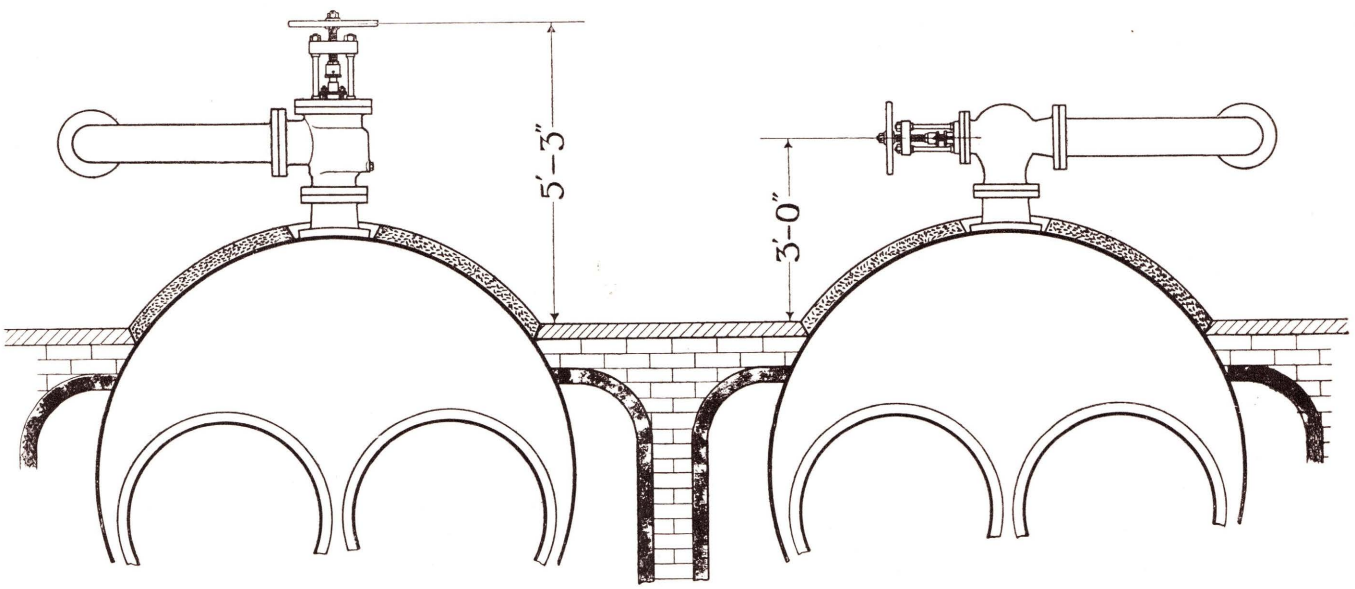


Fig. 12. Ref. B 36·1

The above illustration shows the handiness of the Galloway Patent Angle Pattern Valve compared with standard pattern. No saddle gangway required. Note also small head room.

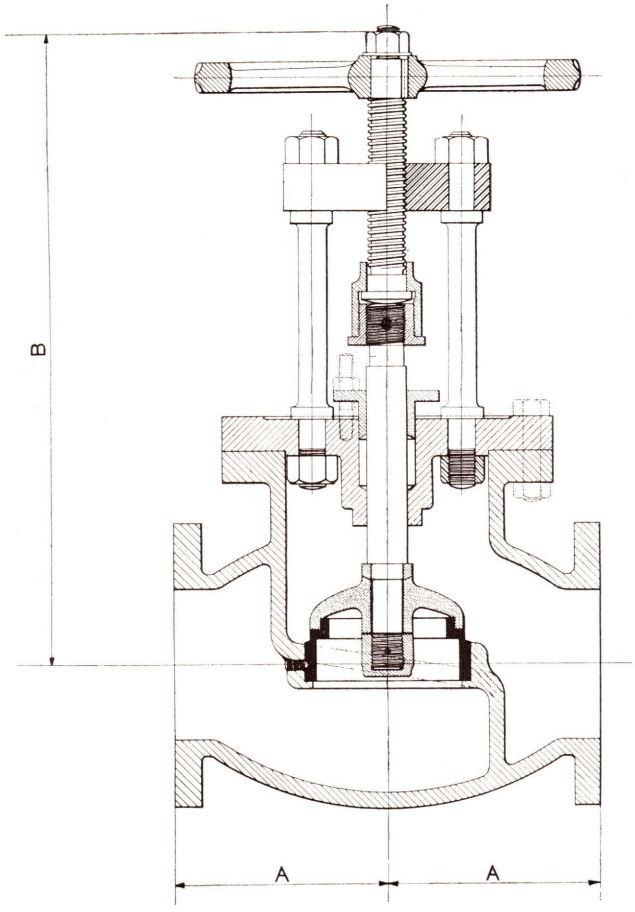
The Galloway Globe Pattern Stop Valve

"Magnam" Metal Valve Face and Seat

Special Features

Divided Spindle.

No rotation of spindle in stuffing box.



Special Features

Easy to open and easy to close by hand wheel only.

No need for levers or crowbars.

Fig. 13. Ref. B 36·1

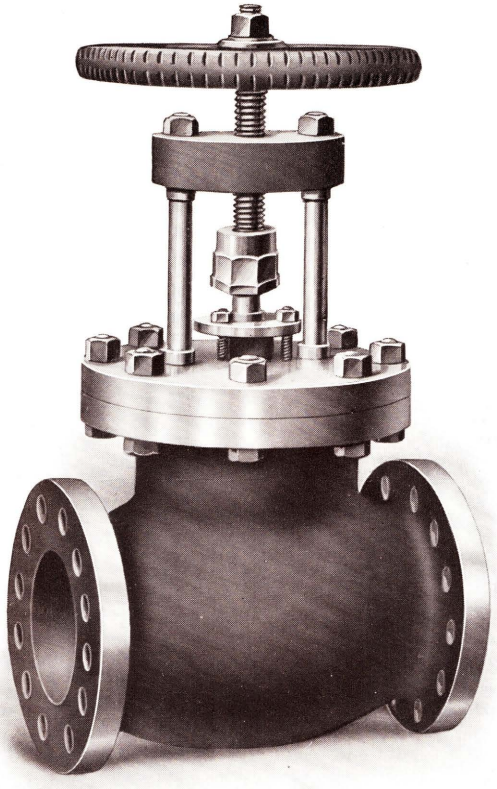
Dimensions of the Galloway Globe Stop Valves

Size of Valve .. .. inches	3	4	5	6	7	8
Diameter of Flanges .. .. inches	8	9	11	12	$13\frac{1}{4}$	$14\frac{1}{2}$
Thickness of Flanges { Cast Iron .. .. .. ,,	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$
Thickness of Flanges { Cast Steel .. .. .. ,,	1	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Number and Size of Bolts .. .. ,,	$8—\frac{5}{8}$	$8—\frac{5}{8}$	$8—\frac{3}{4}$	$12—\frac{3}{4}$	$12—\frac{3}{4}$	$12—\frac{3}{4}$
Diameter of Pitch Circle .. .. ,,	$6\frac{1}{2}$	$7\frac{1}{2}$	$9\frac{1}{4}$	$10\frac{1}{4}$	$11\frac{1}{2}$	$12\frac{3}{4}$
Dimensions A .. .. ,,	$6\frac{5}{8}$	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	$11\frac{1}{2}$
Dimension B, valve closed .. .. ,,	$21\frac{5}{8}$	$22\frac{1}{2}$	$24\frac{1}{2}$	$25\frac{3}{4}$	$29\frac{1}{2}$	$30\frac{3}{4}$

The Galloway Globe Pattern Stop Valve

Special Feature

Spindle of sufficient strength to stand full steam pressure under or over the valve.



Special Feature

Safe to open and close irrespective of direction of the steam flow.

Fig. 14. Ref. B 36·1

The Straight-through Pattern or Globe Valve, Figs. 13 and 14, is made in sizes from 3-in. upwards. The valve and seat are provided with working faces of Galloway's Non-corrosive **" Magnam " Metal,** which makes it specially suitable for use at the superheater outlet or in the main steam range. The valve body and the cover are made of cast steel for working pressures of 160-lbs. per square inch and above. For working pressures below 160-lbs. per square inch and where there is no superheat, the valve body and the cover are often made of cast iron.

The cast-steel body and cover are strongly recommended for high boiler pressures and superheated steam.

The spindle has an external screw made of gun-metal working through the mild steel crossbar. The lower portion of the spindle is made of mild steel, and the valve is attached so as to allow it to seat tightly.

In this design the difference of expansion between the spindle and body is allowed for, and the valve can be opened and closed with ease.

A small pilot valve or bye-pass can be fitted to the valve body if required.

The Galloway Dead-Weight Safety Valve

Fig. 15. Ref. B 36·1

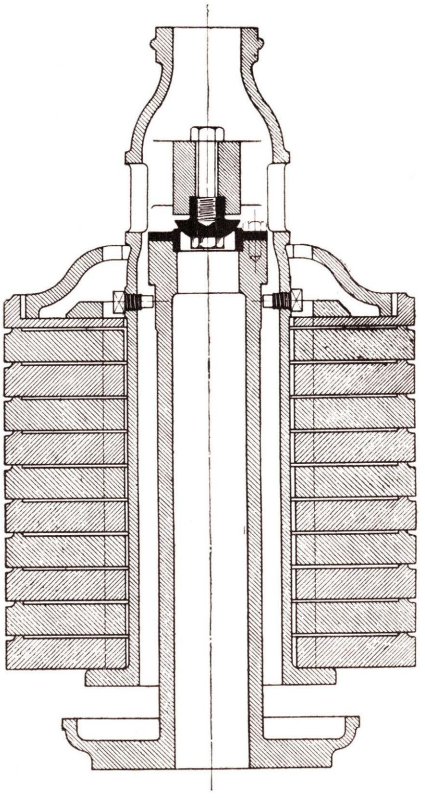


Fig. 16. Ref. B 36·1

The Dead-weight Safety Valve, Figs. 15 and 16, is made suitable for all pressures.

The valve and seat are made of Galloway's **" Magnam " Metal,** which is specially suitable for safety valves on account of **its extreme hardness and freedom from erosion,** or cutting due to the passing of wire-drawn steam.

The cast-iron weights are of neat appearance, and are arranged with the centre of gravity well below the valve seat. The valve is loaded so as to blow off at 5-lbs. above the normal working pressure of the boiler.

The valve diameter for high pressure is $2\frac{7}{16}$-in., and the diameter of the low-pressure valve is 3-in.

The flange which connects to the boiler block is 12-in. diameter, drilled for 12—$\frac{3}{4}$-in. bolts, $10\frac{1}{4}$-in. diameter of pitch circle.

The Galloway Full-Way Parallel Slide Blow-Off Valve

The Galloway Improved Parallel Slide Blow-off Valve, Figs. 17 and 18, is made in two sizes, and provided with a forged mild steel handle.

The valve is suitable for withstanding any boiler pressure up to and including 200-lbs. per square inch.

This valve is fitted with a special Board of Trade locking gland, to prevent removal of the key except when the valve is closed.

The **valve seat and disc** are made of **Galloway's " Magnam " Metal,** which is extremely hard at all temperatures, and does not corrode ; there is, therefore, greatly reduced liability to scoring of the working faces and leakage.

The valve can be opened or shut rapidly by half a turn of the handle or box key.

The main valve body is made in best quality gun-metal, also the valve spindle and the pinion. The rack and pinion are provided with machine-cut teeth.

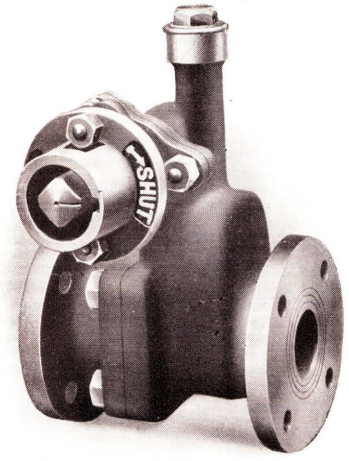


Fig. 17. Ref. B 36·1

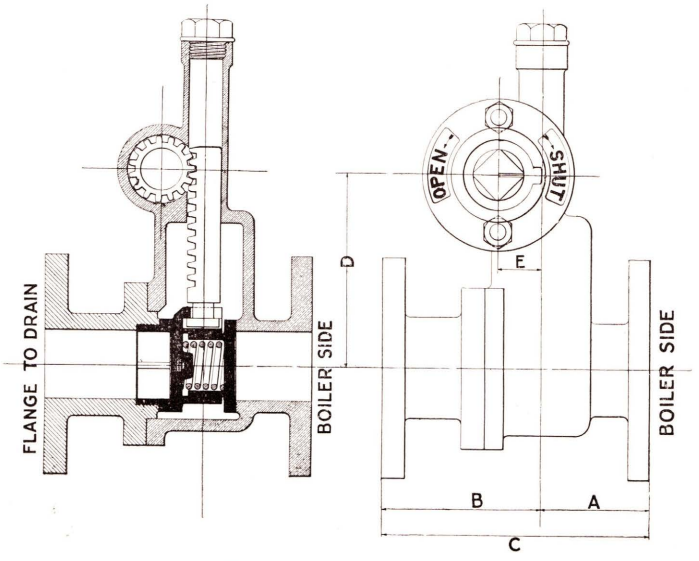


Fig. 18. Ref. B 36·1

Dimensions of the Galloway Full-Way Parallel Slide Blow-Off Valve

Size of Valve . . . . . inches	2	$2\frac{1}{2}$
Diameter of Flanges . . . . . inches	$6\frac{1}{2}$	$7\frac{1}{4}$
Thickness of Flanges . . . . . ,,	$\frac{3}{4}$	$\frac{7}{8}$
Number and Size of Bolts . . . . . ,,	$4—\frac{5}{8}$	$8—\frac{5}{8}$
Diameter of Pitch Circle . . . . . ,,	5	$5\frac{3}{4}$
Dimension A . . . . . ,,	$3\frac{1}{4}$	$3\frac{1}{2}$
Dimension B . . . . . ,,	$4\frac{3}{4}$	$5\frac{1}{2}$
Dimension C . . . . . ,,	8	9
Dimension D . . . . . ,,	$5\frac{3}{4}$	$5\frac{3}{4}$
Dimension E . . . . . ,,	$1\frac{5}{16}$	$1\frac{5}{16}$

The $2\frac{1}{2}$-in. size can be quickly supplied with special flanges, if these are preferred.

The Galloway Patent High Steam and Low Water Safety Valve

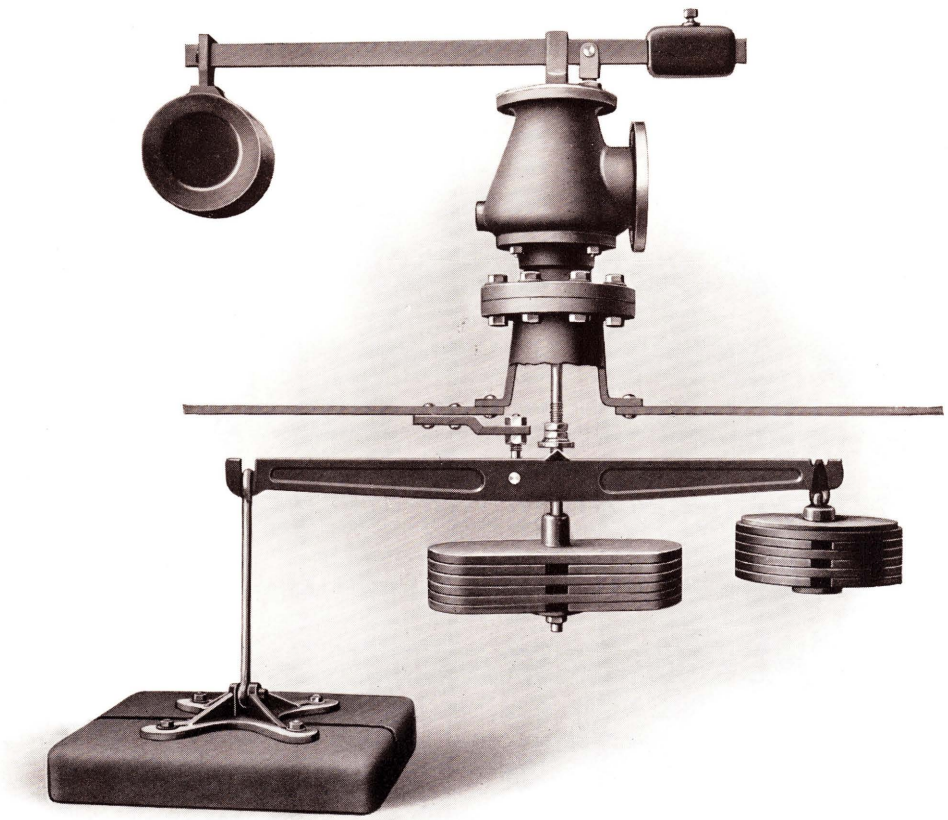


Fig. 19. Ref. B 36·1

Fitted with Galloway's " Magnam " Metal Valves and Seats.

This high-grade and effective safety device is fitted to almost all Galloway and Lancashire Boilers constructed by Galloways Ltd. The special features of the safety valve are its simplicity, reliability, and convenience for examination, see Fig. 20.

The valves and seats are made of **" Magnam " Metal,** which does not corrode or erode, and which is specially suitable for safety valves on account of its hardness and freedom from cutting or scoring of the valve faces.

The top and bottom body, internal lever and the weights are made of cast iron. The internal valve spindle is of wrought steel fitted with two gun-metal adjusting nuts. The fulcrum eyebolt for the internal cast-iron lever is also made of wrought steel, $\frac{3}{4}$-in. diameter, and fitted with a gun-metal fulcrum pin.

For the highest pressures the lower body, which is subject to the full boiler pressure, is made of cast steel.

Size of flange, 12-in. diameter, 12—$\frac{3}{4}$-in. bolts, $10\frac{1}{4}$-in. in diameter of pitch circle.

Particulars of Parts

The Galloway Patent High Steam and Low Water Safety Valve

Each Valve is composed of the following parts :—

1 Cast-iron or Cast-steel Valve Body with Gun-metal Seating and Guard Plate.

1 Cast-iron Bonnet on top body with Gun-metal Neck Bush, Wrought-iron Fulcrum Bracket with Mild Steel Lock Nut and Washer and Gun-metal Fulcrum Pin ; also four $\frac{5}{8}$-in. Studs and Nuts for securing top and bottom castings together.

1 Cast-iron Internal Lever.

1 Cast-iron Weight-holder supporting centre weights.

1 Vitreous Earthenware Float in halves.

1 Cast-iron Cross.

Cast-iron Oval Weights for centre spindle . . } *As per list.*
,, Circular Weights for float balance . . }
,, Cheeseweight for external lever . . }

1 Cast-iron Weight-holder for float balance weights.

1 Cast-iron Jockey Weight for external lever, with $\frac{1}{2}$-in. diameter Set Pin.

The following parts are packed in a case :—

1 Wrought-iron External Lever with Stop Pin.

1 Gun-metal Spindle with Cast-iron Cross-head, Gun-metal Cage Valve complete with Cotter and Pins.

1 Wrought-iron Internal Spindle connected to small Gun-metal Valve, also two Gun-metal Adjusting Nuts.

1 Wrought-iron Fulcrum Eyebolt, $\frac{3}{4}$-in. diameter, with Nuts and Gun-metal Pin for same $\frac{3}{4}$-in. diameter by 3-in. long.

1 Gun-metal Pin, $\frac{5}{8}$-in. diameter by $2\frac{3}{4}$-in. long, securing Cast-iron Cross to Wrought-iron Suspender.

1 Wrought-iron Float Suspender.

4 $\frac{1}{2}$-in. diameter Wrought-iron Bolts with Nuts and Washers securing Float to Cross.

LOW-PRESSURE VALVES With Glazed Fireclay Floats, 27-in. × 23½-in. × 3-in.							HIGH-PRESSURE VALVES With Glazed Fireclay Floats, 26½-in. × 23½-in. × 3⅞-in.						
Working Steam Pressure in lbs. per sq. in.	Weight on External Lever in lbs.	Weight on Centre Spindle in lbs.	Float Balance Weight in lbs.	Float Displacement Fully Immers'd in lbs.	Force Required at Float to Lift Inner Valve in lbs.	Margin of Float Displacement in lbs.	Working Steam Pressure in lbs. per sq. in.	Weight on External Lever in lbs.	Weight on Centre Spindle in lbs.	Float Balance Weight in lbs.	Float Displacement Fully Immers'd in lbs.	Force Required at Float to Lift Inner Valve in lbs.	Margin of Float Displacement in lbs.
60	46	103	105	62¾	16½	46¼	135	103	245	126½	77	36	41
65	50	112	104	62¾	17¾	45	140	107	255	125¼	77	37½	39½
70	53½	122	102½	62½	19¼	43¼	145	111	264	124	77	38¾	38¼
75	57½	131	101½	62½	20½	42	150	114½	274	122¾	77	40	37
80	61	141	100½	62¼	21¾	40½	155	118½	284	121¾	76½	41¼	35¼
85	65	150	99	62¼	23	39¼	160	122	294	120½	76½	42½	34
90	69	160	98	62	24½	37½	165	126	303	119¼	76½	43¾	32¾
95	72½	169	96½	62	25½	36½	170	130	313	118	76½	45	31½
100	76½	179	95½	61¾	27	34¾	175	133½	322	117	76	46½	29½
105	80	188	94½	61¾	28¼	33½	180	137½	332	115¾	76	48	28
110	84	198	93	61½	29½	32	185	141	341	114½	76	49¼	26¾
115	87½	207	92	61½	30¾	30¾	190	145	351	113¼	76	50½	25½
120	91½	217	91	61¼	32	29¼	195	149	360	112¼	75½	51¾	23¾
125	95½	226	90	61¼	33¼	28	200	152½	370	111	75½	53	22½
130	99	236	88½	61	34¾	26¼							

NOTE—Large Valve, $3\frac{3}{4}$-in. diameter, to blow off at 2-lbs. above working steam pressure
Small Valve, $1\frac{9}{16}$-in. ,, ,, ,, 5-lbs. ,, ,, ,,

Weight of External Lever balanced by Jockey Weight. Weight of Balance Weight Holder, $12\frac{1}{2}$-lbs.

Weight of Large Valve and Spindle = 11-lbs. Weight of Small Valve, Spindle and Weight Holder = 20-lbs.

The Galloway High Steam and Low Water Safety Valve

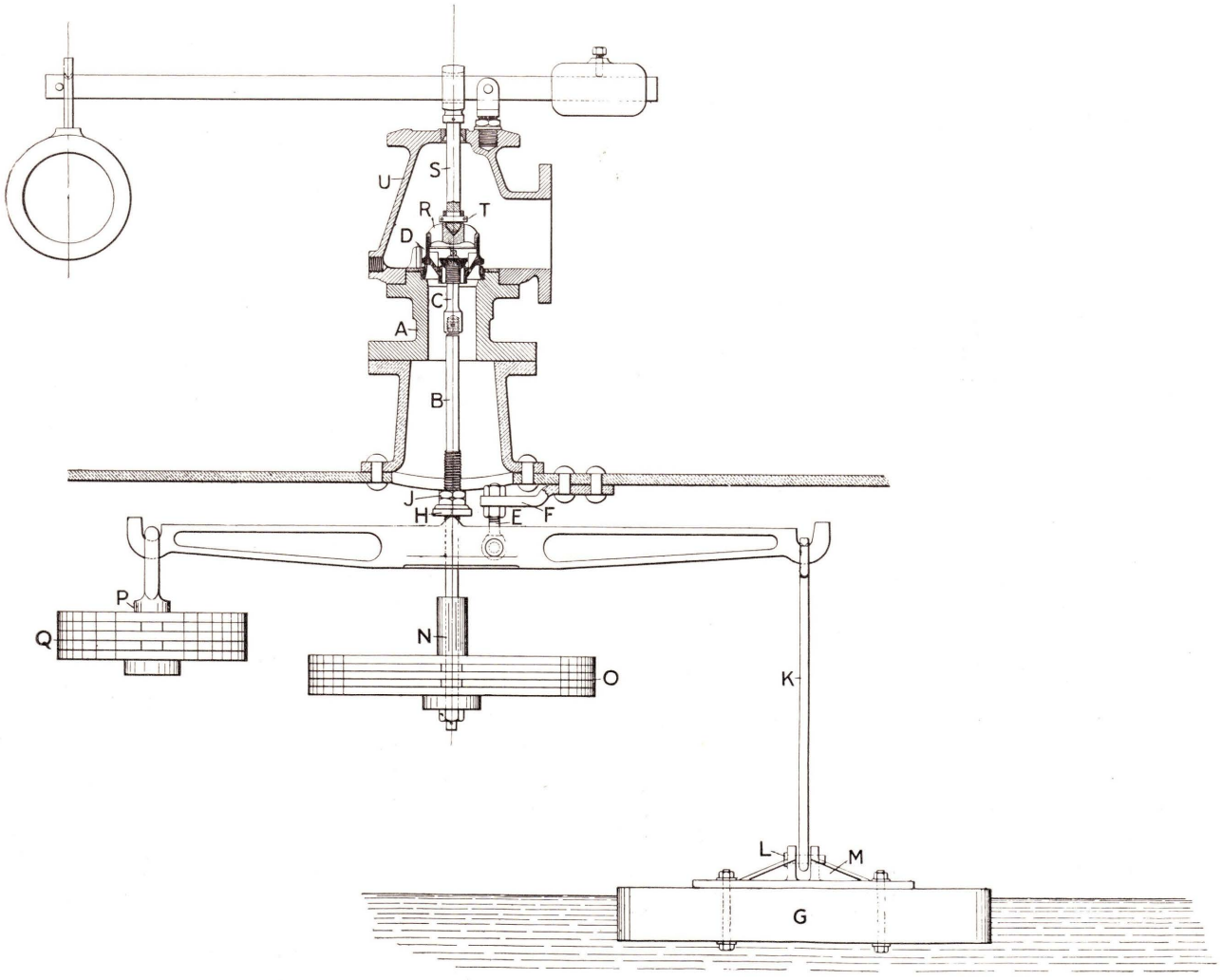


Fig. 20. Ref. B 36·1

(For Instructions for Fixing, see page 21.)

Instructions for Fixing

Bolt on to the boiler standpipe the lower portion of the valve, *i.e.*, the part **A** which contains the main valve seat, taking care that the joint is well made, so that the upper face and valve seat are perfectly level. Connect the lower spindle **B** to the ball valve and spindle **C,** taking care that the cotter pin is fixed and secured, then thread these parts through the large valve **D,** and place these parts in position in the lower portion **A** already fixed. Take into the boiler all internal parts. Screw the hanger of fulcrum **E** to carry the internal lever either into the fulcrum bracket **F,** or into the boiler plate, as the case may be, wherever preparation is made, and which will be on the same side of the valve as it is intended that the float **G** shall be placed.

From below pass on to the centre spindle the two adjusting nuts **H** and **J,** screwing them high up on the spindle. Fix on to the hanger or fulcrum **E** the cast-iron lever, taking care that it is lineable with the centre line of the boiler. Hang the float suspender **K** on to the end of the lever, and fix thereto, by means of the brass pin **L,** the cast-iron cross **M.** Place the halves of the float together, edge to edge, and bolt them up to the cross. Fix the weight holder **N** on to the bottom end of centre spindle, and place thereon the proper number of large (oval) iron plates **O** for the required pressure (see table), taking care that the slots in these weights are on alternate sides. Hang the balance weight holder **P** on to the lever at opposite end to float, and place thereon the required weight of small round plates **Q,** taking care that the slots in these are also on alternate sides. The float should just overbalance the weights at the opposite end of lever, which should be such that they will just barely permit the float to lift the weights on the central spindle, and thus open the inner ball valve **C,** when boiler is empty.

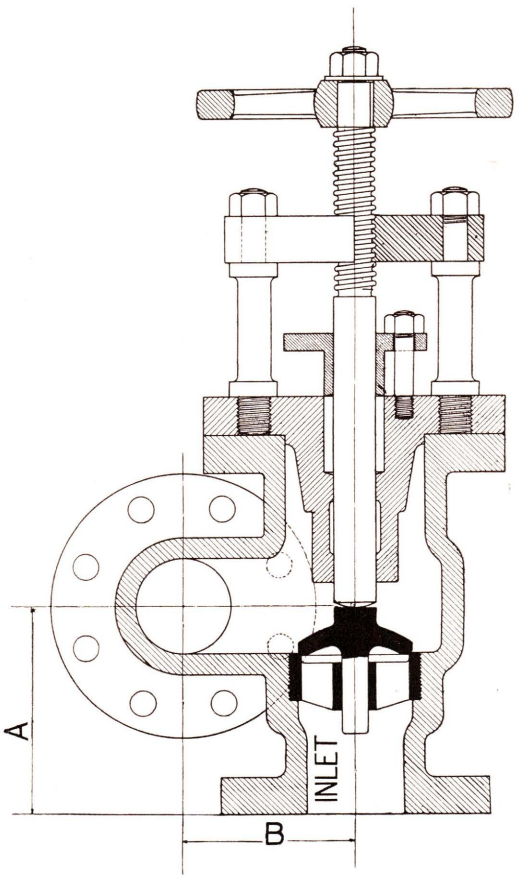
Now adjust the nuts **H J** on the centre spindle, making the following allowance :—For Galloway Boilers when the float is drawn down to touch the flue the ball valve **C** must be open $\frac{3}{16}$ of an inch. For Lancashire Boilers, when the float is drawn down to 3-in. over the top of the flue tubes the valve **C** must be open $\frac{3}{16}$ of an inch. Place in position on the large valve **D** the cage top **R,** to which must be fixed the upper spindle **S,** care being taken that the cotter **T** with pins are fixed and secure, also see that the small grub screws securing the cage top **R** to valve **D** are fixed. Now place the upper portion of valve or bonnet **U** into position, and secure the same to the lower portion **A.** Afterwards fix the external lever in position, hang on the external weight, and fix small balancing weight at opposite end of lever, and valve is ready for work.

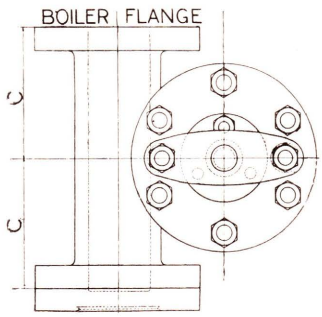
The diagram shows the valve as it stands when the water is at working level.

Special and particular care is desirable and necessary when fixing these valves to ensure that all parts are level, lineable, and central.

All floats absorb a certain amount of water when first put into use, so that, as stated, the float when first fixed should only just slightly overbalance the weights at opposite end of lever. At first opportunity after boiler has been put to work, this internal balancing should be examined, and the balance weights adjusted if found necessary.

The Galloway Check Boiler Feed Valve





Plan.

Fig. 21. Ref. B 36·1

Dimensions of the Galloway Check Feed Valves

Size of Valve . . . . . inches	2	$2\frac{1}{2}$
Diameter of Flanges . . . . . inches	$6\frac{1}{2}$	$7\frac{1}{4}$
Thickness of Flanges . . . . . ,,	1	1
Number and Size of Bolts . . . . . ,,	$4—\frac{5}{8}$	$8—\frac{5}{8}$
Diameter of Pitch Circle . . . . . ,,	5	$5\frac{3}{4}$
Dimension A . . . . . ,,	$5\frac{1}{2}$	$5\frac{1}{2}$
Dimension B . . . . . ,,	$4\frac{1}{2}$	$4\frac{1}{2}$
Dimension C . . . . . ,,	5	$5\frac{1}{2}$

The Galloway Check Boiler Feed Valve

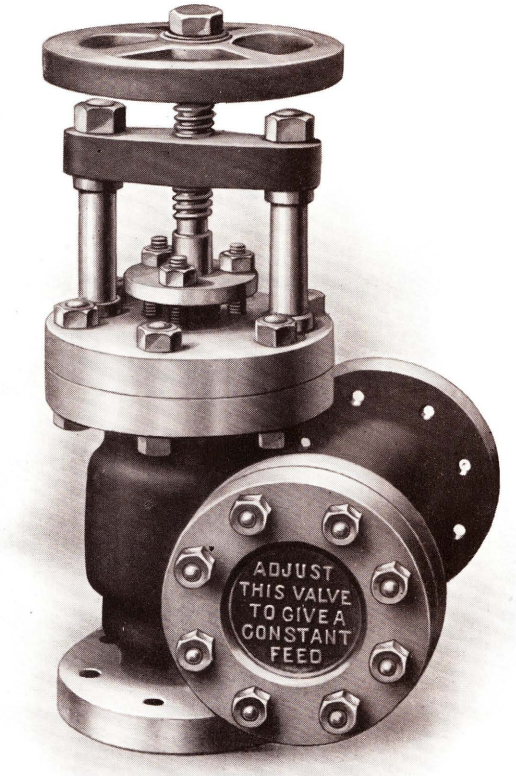


Fig. 22. Ref. B 36·1

The Galloway Check Feed Valve, Figs. 21 and 22, is made in two sizes, and in cast iron or cast steel.

The valve body and the cover are of Siemens-Martin cast steel for working pressures of 160-lbs. per square inch and above.

The valve body and the cover are of cast iron for working pressures below 160-lbs. per square inch.

The **valve and seat** are made of the Galloway special " **Magnam** " **Metal,** which retains its extreme hardness at all temperatures and does not corrode. The valve seats are screwed into the body, and therefore cannot work loose.

The " **Magnam** " **Metal** valve is loose from the valve spindle, so as to act as a check or non-return valve. The lift of the valve and the amount of boiler feed can be regulated or shut off by means of a hand wheel and screw. The gun-metal valve spindle has an external screw working in a forged mild steel crossbar, which is supported by two forged mild steel pillars screwed into the valve body cover.

The illustration, Fig. 22, shows a standard double branch valve which is provided with a polished detachable cover to facilitate cleaning the internal feed pipe.

The cast iron internal feed pipe extends nearly half the length of the boiler, and is provided with perforations on the upper surface, in order to obtain good distribution of the boiler feed water.

The Galloway Water Gauges

Two sets of high-class and specially manufactured Automatic Water Gauges, Figs. 23 and 24, are usually fitted to each boiler. They are provided with gun-metal fittings with parallel asbestos-packed plugs. The fittings are furnished with self-closing valves which, in the event of the glass breaking, automatically close and prevent the escape of water. The cocks can then be shut off with complete safety and a new gauge glass inserted. The gauge glass glands are packed with special rubber cone-shaped washers.

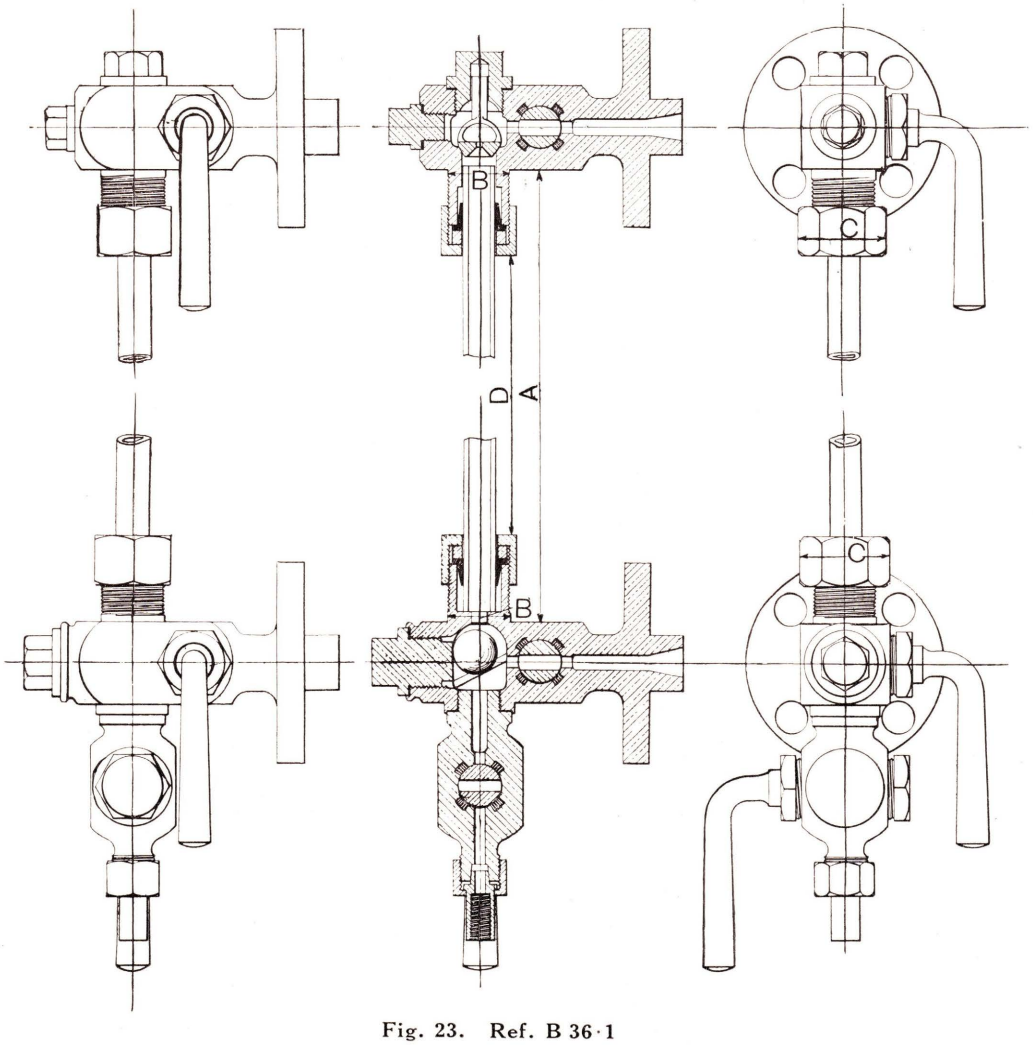


Fig. 23. Ref. B 36·1

Strong guards, Fig. 25, of specially toughened glass fixed in massive gun-metal frames, are fitted to protect the fireman against injury due to breakage of glasses.

A neat gun-metal water level indicator is arranged between the two gauges, supported from the end plate of the boiler. Drain pipes with a connecting tee piece are provided to carry away the waste water and steam.

Dimensions of Galloway Water Gauges for all Pressures

Diameter of Flanges	inches	$4\frac{1}{2}$
Spigot Diameter	,,	$1\frac{1}{8}$
Number and Size of Bolts or Studs	,,	$4—\frac{1}{2}$
Diameter of Pitch Circle	,,	$3\frac{3}{8}$
Diameter of Glass Tubes	,,	$\frac{11}{16}$

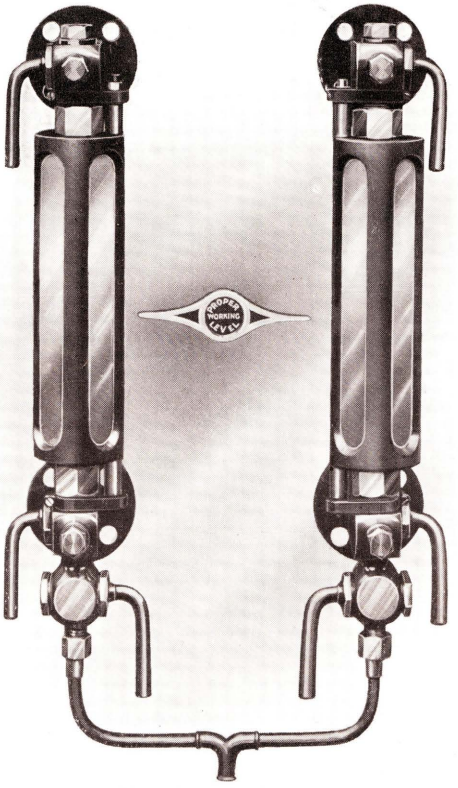


Fig. 24. Ref. B 36·1

When ordering, please state exact vertical centres of top and bottom connection to boiler.

If guards, Fig. 25, are ordered for existing gauges, please state dimensions A and B as well as dimensions across corner of gland nuts C, and vertical distance between faces of gland nuts D, see Fig. 23.

Water gauges for existing boilers can be supplied with flanges and drilling to suit special requirements.

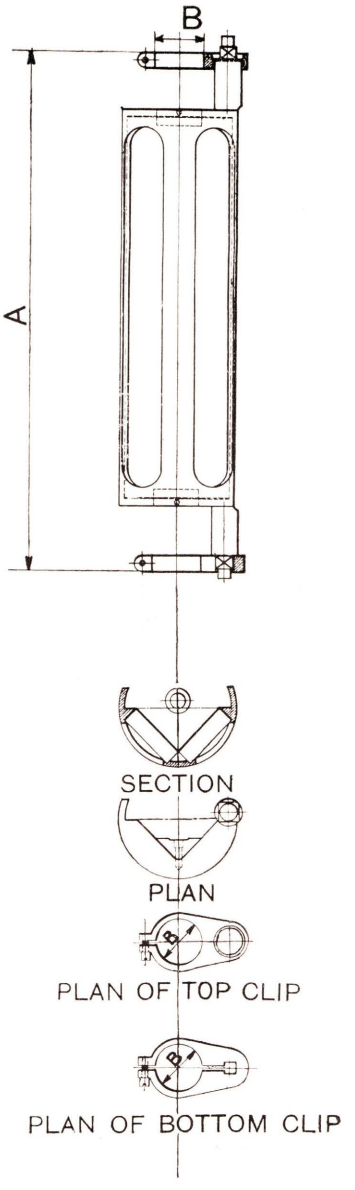


Fig. 25. Ref. B 36·1

The Galloway Steam Pressure Gauge

The Galloway Steam Pressure Gauge, Fig. 27, is constructed with the utmost care to ensure the accuracy and durability of each instrument. The tube is of steel of a specially fine quality and it is screwed into the body and lifter, the joints at the ends of the tubes being made perfectly metallic and not relying upon soldering.

The back plate of the gauge is removable to permit of inspection of the internal parts.

The dial is coated with special white enamel, and is graduated to twice the working pressure, a red line indicates the rated working pressure of the boiler.

The screwed connection to the syphon is $\frac{3}{8}$-in. gas for the 7-in. gauge, and $\frac{1}{2}$-in. gas for the 10-in. gauge.

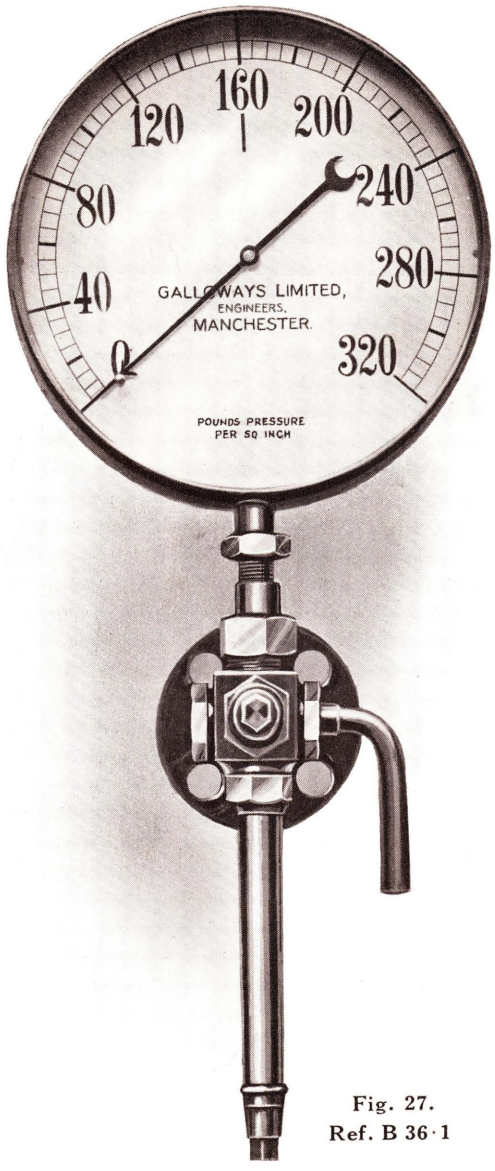


Fig. 27.
Ref. B 36·1

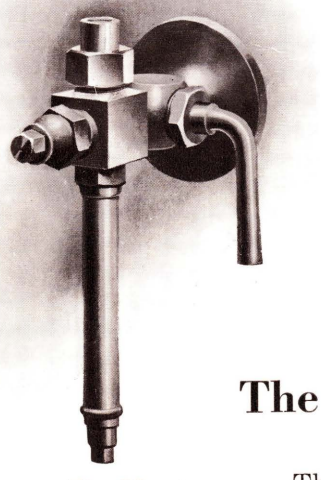


Fig. 26.
Ref. B 36·1

The Galloway Steam Gauge Syphon

(Made in Two Sizes)

The Syphon, Fig. 26, is made of the best selected gun-metal.

The Low-pressure Syphon is suitable for pressures up to and including 100-lbs. per square inch.

The High-pressure Syphon is suitable for pressures exceeding 100-lbs. per square inch.

The screwed connection for the steam gauge is made in two sizes, viz., $\frac{3}{8}$-in. gas and $\frac{1}{2}$-in. gas to suit the pressure gauge.

The syphon flange is 4-in. diameter, spigot $1\frac{1}{8}$-in. diameter, 4—$\frac{9}{16}$-in. holes, $2\frac{7}{8}$-in. diameter of bolt circle.

Special fittings can be supplied when desired.

Galloway Standard Anti-Priming Pipe

The cast-iron Anti-Priming Pipe, which is perforated on the upper side, is supported inside the boiler by two hanger bolts, and connected with the outlet standpipe on the boiler for the steam junction valve.

The Anti-Priming Pipe is made in sizes from 4 to 8-in. diameter. Fig. 28 shows a sketch of the Pipe.

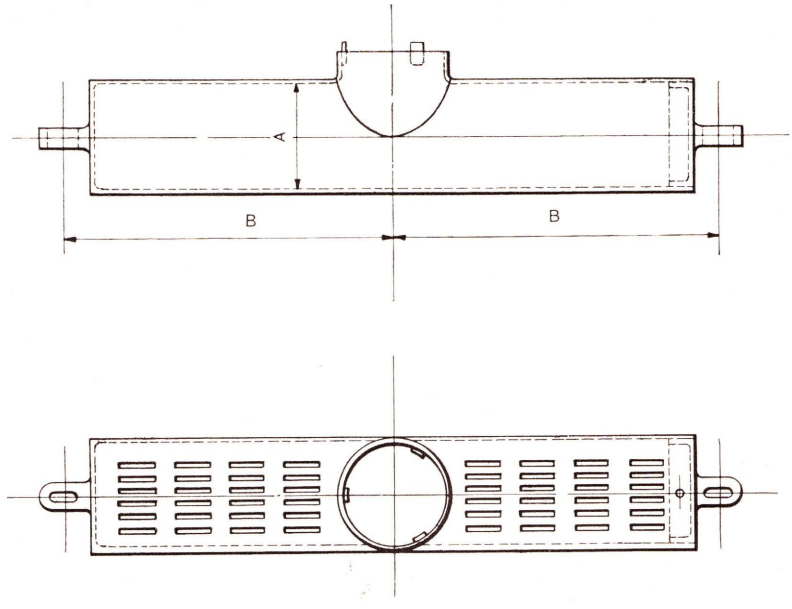


Fig. 28. Ref. B 36·1

Dimensions of Standard Anti-Priming Pipes

Size of Junction Valve . . . . inches	3	4	5	6	7
Dimension A . . . . . ,,	4	5	6	7	8
Dimension B . . . . . ,,	12 and 24	12 and 24	26	26	26
Diameter of Hanger Bolts . . . . ,,	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$

Blow-Off Pipe

The Taper Elbow Pipe, Fig. 29, for connecting the block on the bottom of the boiler shell to the blow-off valve is made of Siemens-Martin cast steel in all cases.

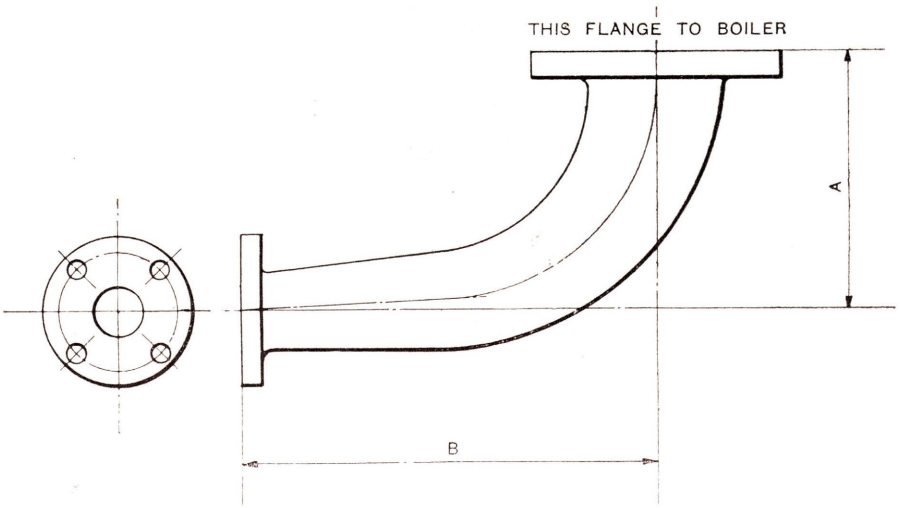


Fig. 29. Fig. B 36·1

Dimensions of Standard Cast-Steel Blow-Off Pipes

Taper Bore . . . . . inches	4 to 2	
Particulars of Flanges	Flange to Boiler Block	Flange to Valve
Diameter of Flange . . . . . inches	9 or 10	$6\frac{1}{2}$
Number and Size of Bolts . . . . . ,,	$8—\frac{5}{8}$,, $6—\frac{7}{8}$	$4—\frac{5}{8}$
Diameter of Pitch Circle . . . . . ,,	$7\frac{1}{2}$,, 8	5
Dimension A . . . . . ,,	10	
Dimension B . . . . . ,,	$16\frac{1}{2}$	

The Galloway Furnace Fittings and Firebars

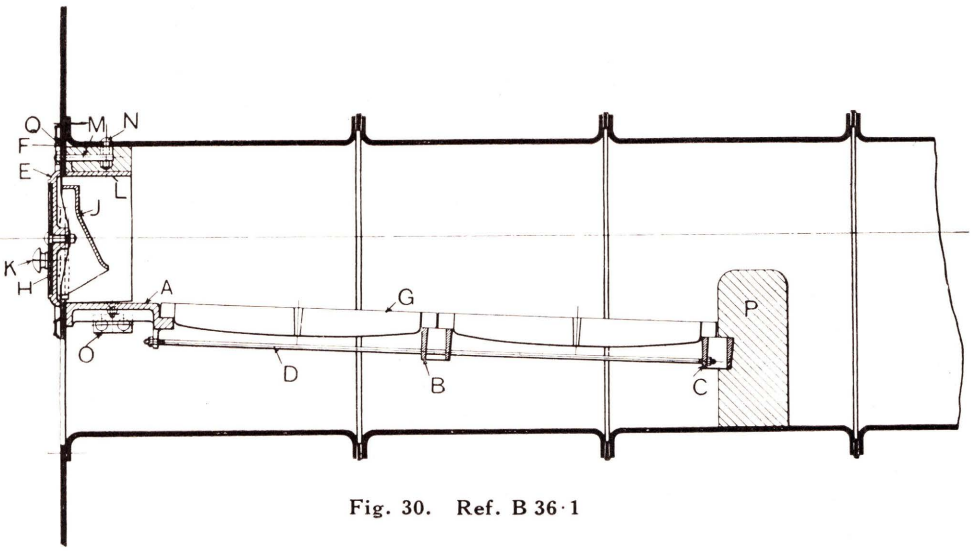


Fig. 30. Ref. B 36·1

Index of Parts

A. Cast-iron Deadplate.
B. No. 1 Cast-iron Bearer.
C. No. 2 Cast-iron Bearer.
D. Mild Steel Stay Rods.
E. Cast-iron Fire Door.
F. Mild Steel Furnace Front Plate.
G. Cast-iron Firebars.
H. Cast-iron Door Star Plate.
J. Cast-iron Baffle Plate.
K. Mild Steel Bolt.
L. Cast-iron Fire Back.
M. Mild Steel Eye-bolts for Furnace Front Plate.
N. Mild Steel Stud for Eye-bolt.
O. Mild Steel Brackets for Deadplate.
P. Bridge Wall.
Q. Brass Bead.

The Sectional Drawing, Fig. 30, shows a longitudinal section through the standard furnace of a Galloway or a Lancashire Boiler. One set of wrought-iron fire frames is fitted to each furnace ; they are provided with cast-iron doors of special design, each with internal baffle plate and external circular ventilating slide or star plate to regulate the admission of air. Cast-iron dead plates, bearing bars, and tie rods are also fitted.

The Galloway Standard Firebars are made in varying lengths up to 3-ft. to suit the length of grate. They are made of a suitable and specially selected quality of cast iron and are machine moulded. The upper surface of the firebar is chilled. This chilled zone is of extraordinary hardness and results in maximum life of the firebar.

Standard Dampers for Side Flues

Fig. 31. Ref. B 36·1

Fig. 31 shows a sketch of the Galloway Standard Damper for the side flues. The damper blade and frame are made of specially selected cast iron. The framing itself is made in halves, which are locked together by projections on one half fitting into corresponding recesses in the other half.

The standard sizes are 5-ft. × 12-in. and 6-ft. × 12-in. in the opening.

The standard guide pulley and bracket for the damper chain is shown in Fig. 32.

The bracket and pulley are both made of cast iron. A balance weight, a length of chain about 10-ft. long with shackles, and " S " hooks are supplied with each damper.

Diameter of Pulley	12 inches
Dimension A	$5\frac{1}{2}$,,
Dimension B	9 ,,
Dimension C	11 ,,
Centres of Bolts	$6\frac{1}{2}$,,

2 Bolts, $\frac{5}{8}$-in. diameter.

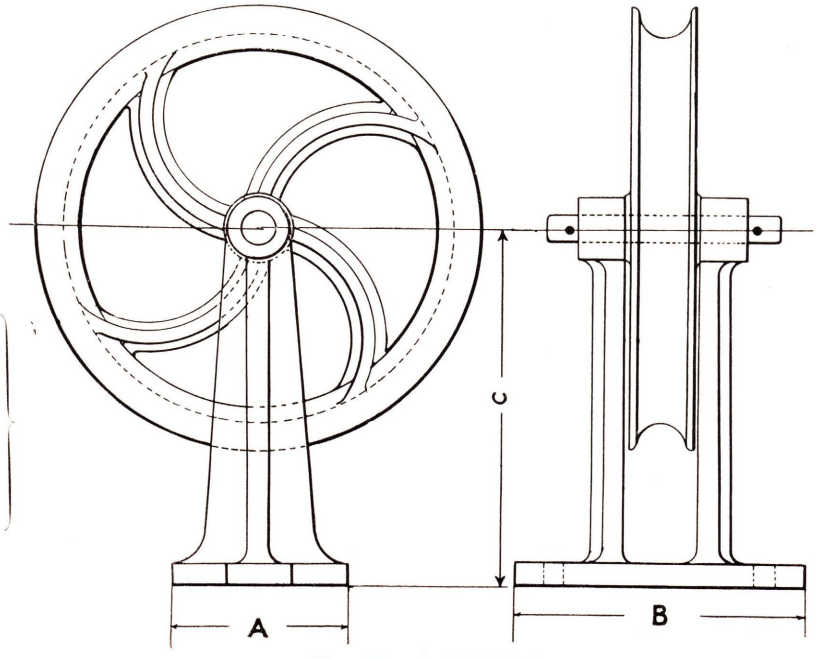


Fig. 32. Ref. B 36·1

Standard Ashpit Frames and Plates
in Front of Boiler

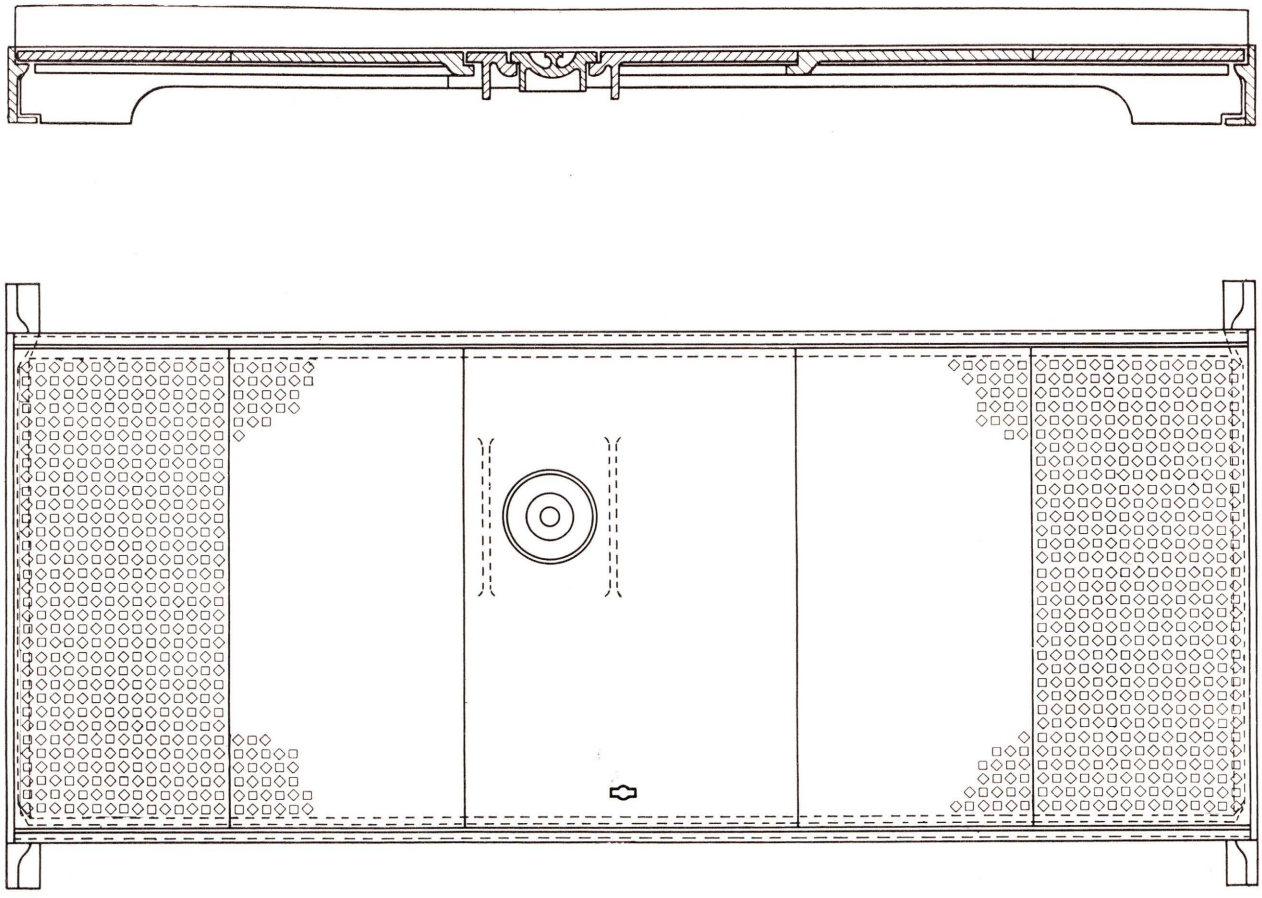


Fig. 33. Ref. B 36·1

A Floor-plate Frame of cast iron is shown in Fig. 33, for supporting the cast-iron ashpit floor-plates in front of the boiler. The standard size of frame is 7-ft. 6-in. long by 3-ft. 0-in. wide.

Soot Cleaning Door and Frame

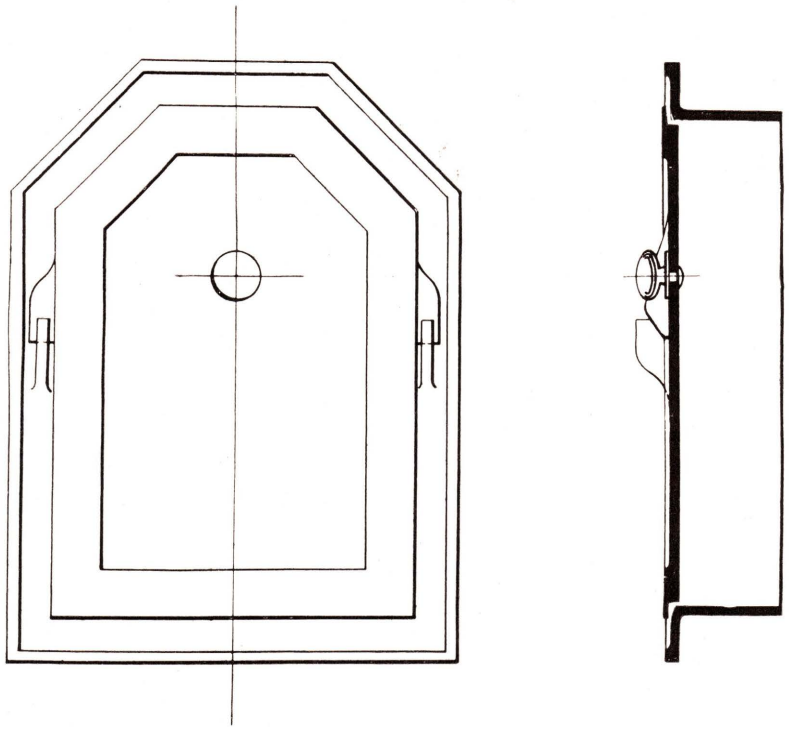


Fig. 34. Ref. B 36·1

The above Fig. 34 shows the Galloway Standard Pattern of Cast-iron Door and Frame, which is built into the front wall of all Lancashire and Galloway Boilers to give access to the side flues for inspection and cleaning. The size of opening in the frame is 14-in. wide by 20-in. high.

Weldless Pressed Wrought Steel Standpipes

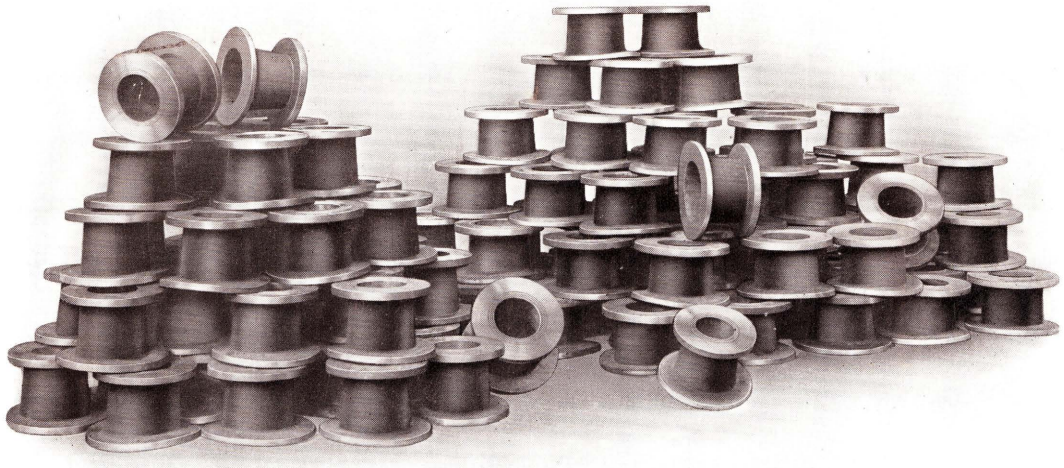


Fig. 35. Ref. B 36·1

Group of Standpipes.

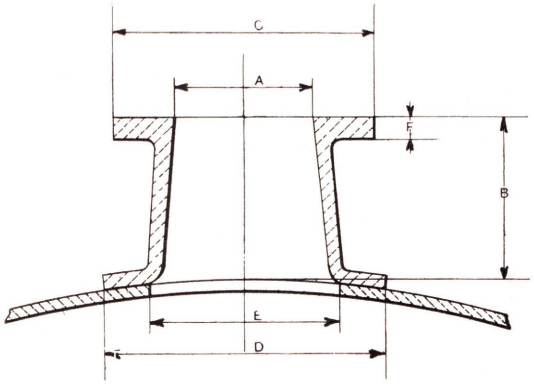


Fig. 36. Ref. B 36·1

The manufacture of Weldless Wrought Steel Standpipes or Bases forged from the solid, for the attachment of Boiler Fittings, has recently been developed at our Boiler Works. The bolting flanges are machined on face for joint and turned on the edge. The riveting flanges are turned on the edge.

Large numbers of these Standpipes are supplied to the trade. The table below gives particulars of standard sizes. Slight modifications to the diameter of both flanges can be made if necessary.

Dimensions of Standpipes. British Standard Flanges

Bore .. A .. .. inches	2	$2\frac{1}{2}$	3	4	5	6	7	8
Dimension B .. .. ,,	8	8	8	8	8	8	8	8
,, C .. .. ,,	$6\frac{1}{2}$	$7\frac{1}{4}$	8	9	11	12	$13\frac{1}{4}$	$14\frac{1}{2}$
,, D .. ,,	$9\frac{3}{4}$	$10\frac{1}{4}$	$10\frac{3}{4}$	$11\frac{1}{4}$	$12\frac{1}{4}$	$13\frac{1}{4}$	$14\frac{1}{4}$	$15\frac{1}{4}$
,, E .. .. ,,	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$	$10\frac{1}{2}$
,, F .. .. ,,	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	1	1	$1\frac{1}{8}$	$1\frac{1}{8}$

Wrought Steel Manhole Mouthpiece

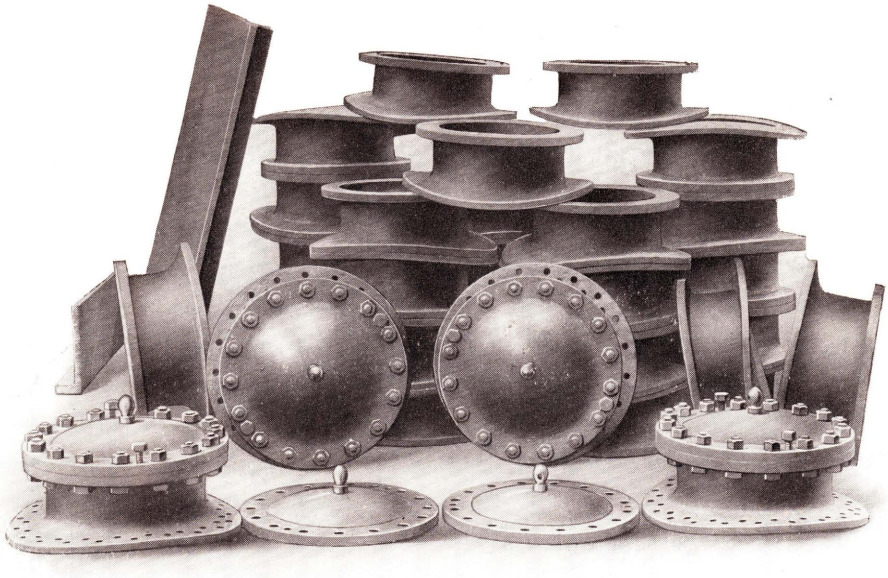


Fig. 37. Ref. B 36·1

Group of Manholes.

The Standard Wrought Steel Manhole Mouthpiece is made from a special rolled section of bar bent up and welded. The body is $16\frac{3}{4}$-in. internal diameter and of ample height to allow the bolts to be readily inserted from the underside. It is attached to the crown of the boiler by means of a double row of rivets. The upper flange is faced in machine to receive the wrought steel cover, which is secured by bolts and nuts, and fitted with a lifting eye. The cover bolts are provided with heads of our special design, so arranged that the bolts will not rotate in their holes when the nuts are being screwed up ; this is a very important feature.

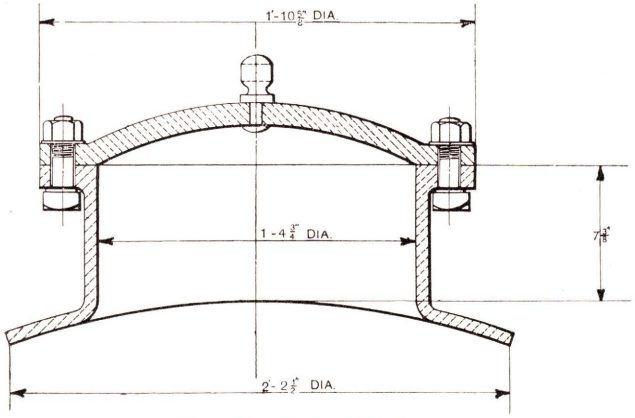


Fig. 38. Ref. B 36·1

Wrought Steel Pressed Manholes and Mudholes

Fig. 39. Ref. B 36·1

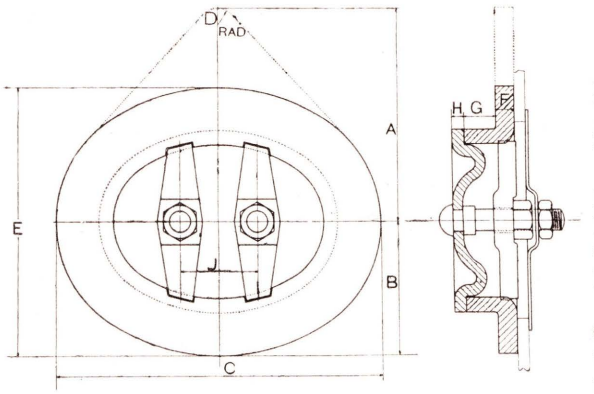


Fig. 40. Ref. B 36·1

Large numbers of pressed steel manholes and mudholes are manufactured by Galloways Ltd., both for their own use and also for other makers in the trade.

The mouthpiece is of the raised internal pattern with flange for riveting to the front end plate or the shell. The larger sizes for the front end plate of Lancashire Boilers are provided with peak on the upper side.

The mouthpiece and the door are machined on the faces for joint, and the cover is arranged so that the joint may be readily made to withstand the highest pressures, without danger of the joint blowing out.

The mouthpiece can be supplied with the flange bent to any desired radius.

The cover is secured by stout mild steel crossbars, bolts and nuts, and is provided with protecting guard plate.

The small handhole covers can be supplied with or without compensating rings.

Mark No.	Dia. of Boiler.	Size of Opening.	A	B	C	D	E	F	G	H	J	Style.
1	9′ 0″	16″ × 12″	20″	10″	24″	1½″	—	1½″	2⅛″	7/16″	6½″	Peaked
2	8′ 6″	16″ × 12″	17¼″	10″	24″	1½″	—	1⅜″	2¼″	7/16″	6½″	,,
3	8′ 0″	15″ × 11″	15¼″	9½″	23″	1½″	—	1¼″	2¼″	7/16″	5½″	,,
4	7′ 6″	15″ × 11″	13¾″	9½″	23″	1½″	—	1¼″	2¼″	7/16″	5½″	,,
5	7′ 0″ and 6′ 6″	15″ × 11″	—	9½″	23″	—	19″	1⅛″	2¼″	7/16″	5½″	Oval
6	6′ 0″ and 5′ 6″	14″ × 10″	—	8⅝″	21¼″	—	17¼″	1″	2¼″	7/16″	5″	,,,
7	—	9″ × 6″	—	—	—	—	—	—	—	5/16″	—	,,
8	—	8″ × 6″	—	—	—	—	—	—	—	5/16″	—	,,
9	—	6″ × 4″	—	—	—	—	—	—	—	¼″	—	,,
10	—	5″ × 3½″	—	—	—	—	—	—	—	⅜″	—	,,

Equipment
for
Oil Burning

Temporary or
Permanent
Conversions.

Steam Atomising Principle.
Gravity Oil Feed.

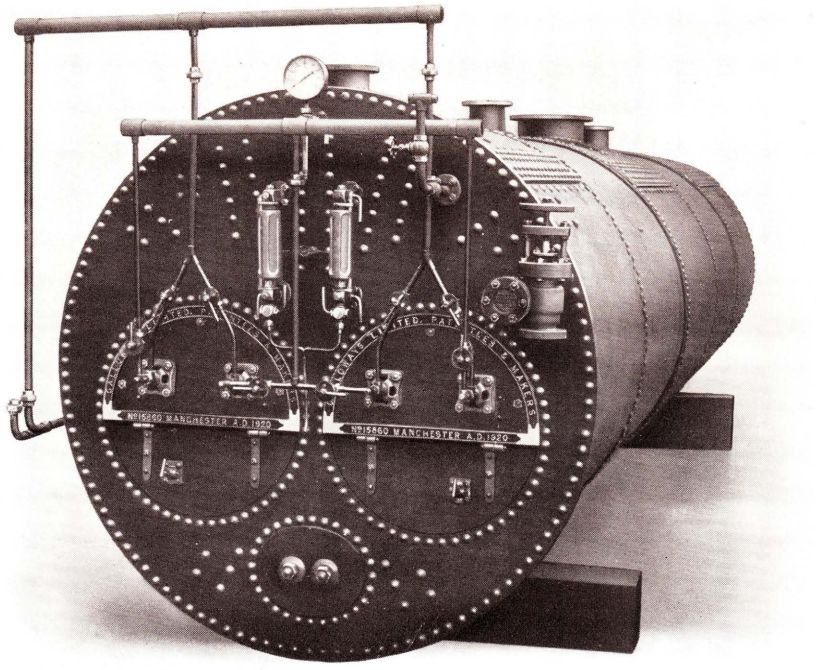


Fig. 41. Ref. B 36·1
Lancashire Boiler fitted with permanent Galloway Oil Burning Equipment.

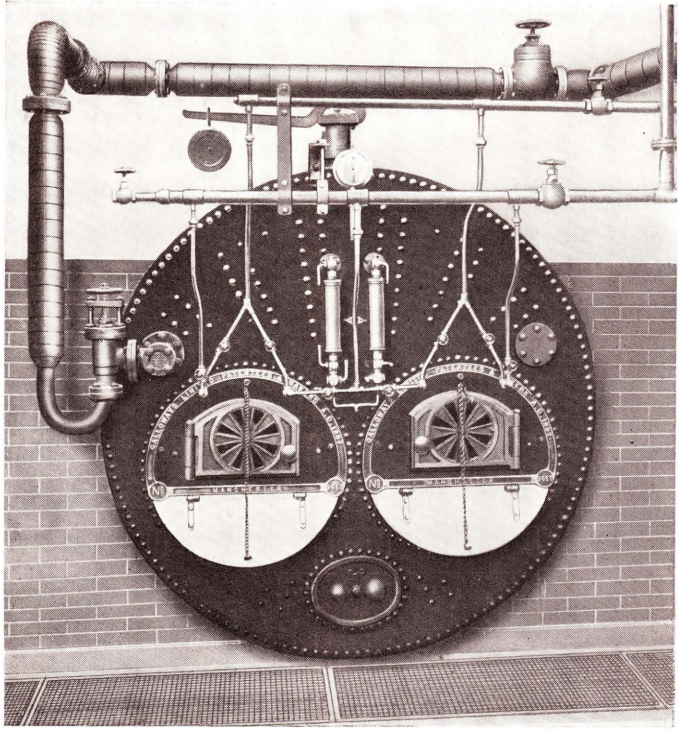


Fig. 42. Ref. B 36·1
Lancashire Boiler with Auxiliary Galloway Oil Burners.

Will burn with equal efficiency either heavy mineral fuel oil or tar and creosote oil.

Burners only supplied, or complete equipment with tanks, pipes, valves, etc.

The Galloway Automatic Isolating Valve

"Magnam" Metal Valve Face and Seat

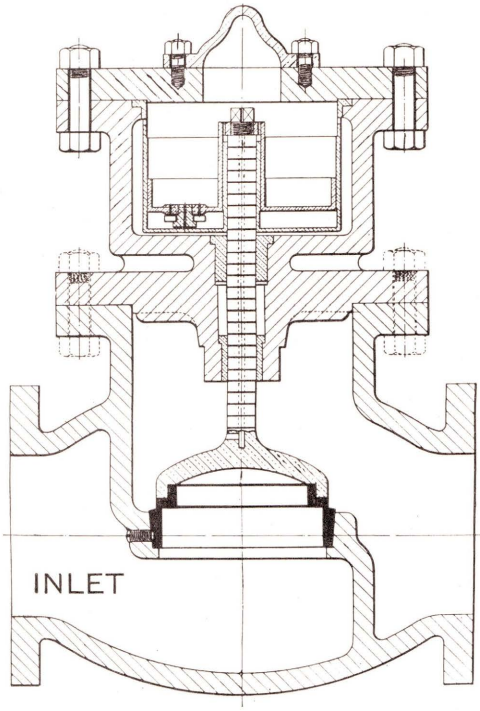


Fig. 43. Ref. B 36·1

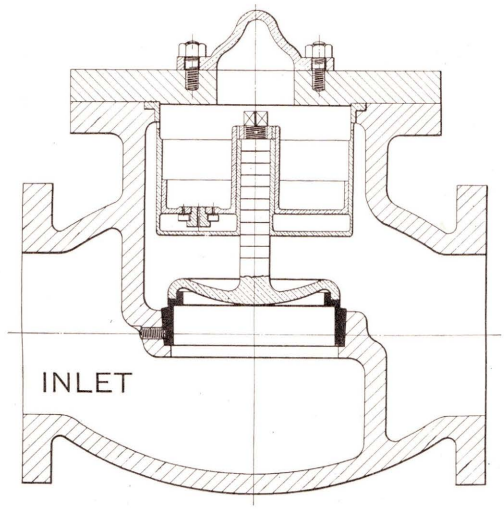


Fig. 44. Ref. B 36·1

In installations comprising more than one boiler a Galloway Isolating Valve fitted on the outlet side of the junction valve is a useful safeguard. The Isolating Valve automatically closes and prevents steam entering the boiler from the main when the pressure in the pipe is greater than that in the boiler. Also when the boiler is out of commission for cleaning and inspection purposes, the Isolating Valve prevents steam passing to the boiler in the event of the junction valve being left open, thus avoiding accident.

The Isolating Valve is perfectly noiseless in operation, and remains open when the boiler is working and steam is passing. The valve is made in two patterns, one for superheated steam, Fig. 43, the other for saturated steam, Fig. 44.

The valve and seat are provided with **working faces** of Galloways' **"Magnam" Metal.** The valve body and cover are made of cast steel for working pressures of 160-lbs. per square inch and above. For working pressures below 160-lbs. per square inch the valve body and the cover are usually made of cast iron. The dimensions over flanges, and the diameter of flanges, are the same as those given for Globe Stop Valves on page 14.

Dimensions of British Standard Pipe Flanges

Table II.

Bore of Valve.	Diameter of Flange.	Diameter of Bolt Circle.	Number of Bolts.	Diameter of Bolts.
inches.	inches.	inches.		inches.
$\frac{1}{2}$	$3\frac{3}{4}$	$2\frac{5}{8}$	4	$\frac{1}{2}$
$\frac{3}{4}$	4	$2\frac{7}{8}$	4	$\frac{1}{2}$
1	$4\frac{3}{4}$	$3\frac{7}{16}$	4	$\frac{5}{8}$
$1\frac{1}{4}$	$5\frac{1}{4}$	$3\frac{7}{8}$	4	$\frac{5}{8}$
$1\frac{1}{2}$	$5\frac{1}{2}$	$4\frac{1}{8}$	4	$\frac{5}{8}$
2	$6\frac{1}{2}$	5	4	$\frac{5}{8}$
$2\frac{1}{2}$	$7\frac{1}{4}$	$5\frac{3}{4}$	8	$\frac{5}{8}$
3	8	$6\frac{1}{2}$	8	$\frac{5}{8}$
$3\frac{1}{2}$	$8\frac{1}{2}$	7	8	$\frac{5}{8}$
4	9	$7\frac{1}{2}$	8	$\frac{5}{8}$
5	11	$9\frac{1}{4}$	8	$\frac{3}{4}$
6	12	$10\frac{1}{4}$	12	$\frac{3}{4}$
7	$13\frac{1}{4}$	$11\frac{1}{2}$	12	$\frac{3}{4}$
8	$14\frac{1}{2}$	$12\frac{3}{4}$	12	$\frac{3}{4}$
9	16	14	12	$\frac{7}{8}$
10	17	15	12	$\frac{7}{8}$
12	$19\frac{1}{4}$	$17\frac{1}{4}$	16	$\frac{7}{8}$
14	$21\frac{3}{4}$	$19\frac{1}{2}$	16	1
15	$22\frac{3}{4}$	$20\frac{1}{2}$	16	1
16	24	$21\frac{3}{4}$	20	1
18	$26\frac{1}{2}$	24	20	$1\frac{1}{8}$
20	29	$26\frac{1}{2}$	24	$1\frac{1}{8}$
21	30	$27\frac{1}{2}$	24	$1\frac{1}{8}$
24	$33\frac{1}{2}$	$30\frac{3}{4}$	24	$1\frac{1}{4}$

Code Word for Sizes.

Diameter of Bore.	Code Word.	Diameter of Bore.	Code Word.	Diameter of Bore.	Code Word.	Diameter of Bore.	Code Word.
inches.		inches.		inches.		inches.	
½	Diber	3	Digem	7	Dimek	11	Divec
1	Dicit	4	Dihib	8	Dipiv	12	Diwif
2	Didan	5	Dikas	9	Disad		
2½	Difox	6	Dilop	10	Ditol		

Code Word for Fittings.

Description.	Fig. No.	Code Word.	Description.	Fig. No.	Code Word.
Junction Valve (Cast Steel) ..	8 & 9	Exabi	Pressure Gauge	27	Exeon
,, ,, (Cast Iron) ..	8 & 9	Execo	Anti-Priming Pipe ..	28	Exoql
Globe Stop Valve (Cast Steel)	13 & 14	Exidu	Blow-off Pipe	29	Exurk
,, ,, (Cast Iron)	13 & 14	Exofv	Furnace Fittings	30	Exasj
Dead-weight Safety Valve ..	15 & 16	Exugy	Damper	31	Exeti
Blow-off Valve	17 & 18	Exeju	Damper Pulley	32	Exiuh
High Steam and Low Water Safety Valve	19 & 20	Exaht	Floor Frame and Plate ..	33	Exovg
Feed Valve (Cast Steel) ..	21 & 22	Exiks	Soot Door and Frame ..	34	Exuwf
,, (Cast Iron)	21 & 22	Exolt	Standpipe	36	Exaxe
Water Gauges	23 & 24	Exump	Manhole	38	Exeyd
,, Guard	25	Exano	Isolating Valve	43	Exizc
Pressure Gauge Syphon ..	26	Exipm	,, ,, ...	44	Exoab

Code Word for Working Pressure.

Working Pressure, Lbs. per sq. in.	Code Word.	Working Pressure, Lbs. per sq. in.	Code Word.	Working Pressure, Lbs. per sq. in.	Code Word.	Working Pressure, Lbs. per sq. in.	Code Word.
10	Pobut	75	Povip	135	Prono	195	Primu
15	Pocab	80	Powoq	140	Probt	200	Prunc
20	Podec	85	Poyur	145	Propu	205	Prupe
25	Pofid	90	Pozas	150	Praqa	210	Prurf
30	Pogoe	95	Preba	155	Prare	215	Prusg
35	Pohuf	100	Prece	160	Prasi	220	Pruti
40	Polag	105	Predi	165	Prato	225	Pruvl
45	Pomeh	110	Prefo	170	Pravu	230	Plabe
50	Ponij	115	Pregu	175	Prida	235	Plech
55	Popok	120	Proha	180	Prife	240	Plido
60	Porul	125	Prole	185	Prigi	245	Plofr
65	Posam	130	Promi	190	Prilo	250	Plukt
70	Poten						

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